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ABSTRACT

This study investigates the role of textbooks in secondary geography instruction. In chapter 1, the origins and purpose of this study are outlined, and chapter 2 is a literature review of English and U.S. research that mentions geography textbooks while focusing specifically on content analysis. Chapter 3 outlines the broad case study approach which was adopted for this study and which involved recording textbook use and analysis of the texts, as well as questionnaires to elicit student perceptions and attitudes, and interviews with teachers. The application of the case study approach to geography instruction by 10 secondary geography teachers in England is described in chapter 4. Their use of textbooks is presented through summaries of interviews, and student responses. Chapter 5 presents the conclusions of the study, and discusses limitations and implications of the case study approach. The appendices contain: (1) the references for textbook advice to teachers; (2) a teacher form for recording classes; (3) a textbook use form; (4) the student questionnaire with instructions; (5) instructions and a sample cloze test; (6) an outline for teacher interviews; (7) a chart for teacher's use of a textbook; (8) readability scores of geography textbooks; (9) tabulations and a summary of the textbook analyses; (10) results of the students' questionnaires; (11) students' responses to the 14 teaching strategies; and (13) the rank order of 14 teaching strategies by the participating teachers. Graphs, charts, and a 50-page bibliography are included. (DJC)

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A STUDY OF THE USE OF GEOGRAPHY TEXT BOOKS BY SELECTED TEACHERS IN ENGLISH SECONDARY SCHOOLS

JOHN GRAHAM LIDSTONE

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Submitted for the degree of
Ph.D.
at the University of London
1985

University of London Institute of Education

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ABSTRACT

This study investigates the role of text books in the teaching of geography. An introductory chapter describes the origins and purpose of the study.

In Chapter Two, a review is made of the research on the use of text books in English classrooms and the wider research pertaining to the effectiveness in promoting learning of the elements comprising many geography text books, including text, pictures, maps, diagrams, graphs and tables of figures.

Chapter Three outlines the broad case study approach adopted in this investigation. This involved the keeping of diary records of text book usage, and the analysis of these text books in terms of readability, use of the various modes of data presentation, and type and use of questions and activities. The pupils' perceptions and attitudes towards the text books and their use were elicited through questionnaires which included semantic differentiation. The ability of the pupils to interpret the text was tested by cloze procedures. Finally, the individual teachers and the writer discussed in informal interviews the evidence provided by the diaries, text book analyses and pupils' responses, in order to elicit understanding of the role of text books in specific classrooms.

Chapter Four describes the results of the application of this case study approach to the work of ten geography teachers in England with some eighteen teaching groups of secondary age.

Finally, in Chapter Five, a three-fold approach to the interpretation of the case studies is suggested in order to illuminate the uses being made of text books in geography classrooms and the teachers' perceptions of their role in teaching geography. The implications of the study for future curriculum developments in geography are discussed.

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The teachers who participated in this study with such care and good humour deserve special mention, but the nature of the study requires that they remain anonymous. I am very grateful for the time and effort they expended on a project from which they had little to gain and potentially much to lose.

My greatest thanks are reserved for my own family. As well as having to tolerate a distracted son, husband and father for far too long, they have acted as research assistants, couriers and audience as the work has progressed. My hope is that Christopher and Anna are not permanently disenchanted with higher education as a result.

Brisbane, November 1985.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

In 1948, Bartlett commented that:

> "The text book as used in geography teaching has not been the subject of much research, yet as one of the most common aids to teaching geography, it should possibly have done so."

Twenty years later, the present writer, undergoing initital training as a teacher, was disconcerted to find that not only was no mention made of text books and their use during the course, but that their use during periods of teaching practice was positively discouraged, even though observation of experienced classroom teachers suggested that text books played a major part in their work.

As a result of this rather negative approach to text books during training, the writer's early years of teaching were spent in the earnest preparation of teaching materials interspersed with periods of strong guilt feelings whenever the exigencies of the moment persuaded him to use text book materials.

Upon promotion to the headship of a small geography department, the writer was faced with the task of producing a geography syllabus for the first three years of secondary education which could be taught by teachers trained in a number of different subject areas. The solution adopted was to tie the syllabus closely to a text book series for which the authors also provided Teachers' Guides, in which they set out their educational assumptions and aims together with a justification for the teaching methods implied in the teaching materials provided in the books (Rolfe et al. Oxford Geography Project series). This solution appeared to meet with the approval of both staff and pupils, and in due course an evaluation of the second and third year geography courses of the school was attempted (Lidstone 1977). This study, while confirming that the pupils were generally enthusiastic about their geography courses, showed that the aims and approaches of the teachers in using the materials had developed in very different ways, and the result was that the school was effectively offering four different geography curricula based on the same materials.

If a text book series and Teachers' Guides may be subsumed in Parlett and Hamilton's (1976) concept of an "instructional system ... a set of elements arranged to a coherent plan ... a set of pedagogic assumptions, a new syllabus and details of techniques and equipment", then the findings of Lidstone (1977) agreed with their suggestion that:

> "The instructional system may remain as a shared idea, abstract model, slogan or shorthand, but it assumes a different form in every situation. Its constituent elements are emphasised, or de-emphasized, expanded or truncated as teachers .... and students interpret and re-interpret the instructional system for their particular setting. In practice, objectives are commonly re-ordered, re-defined, abandoned or forgotten."
> (Parlett and Hamilton, 1976, p. 89)

While this statement suggests an acceptance that teachers will inevitably "interpret" an instructional system for "their own particular setting", it contrasts with Dalton's (1977) statement, made in the context of a study of the dissemination process of the Schools Council "Geography for the Young School Leaver" project, that:

> "...teachers who have nothing to do with the development stage of a project find themselves handling new materials with inadequate perceptions of the underlying philosophy, assumptions, design and purpose of these materials."(p. 43)

These two statements reflect the different perceptions of impartial evaluators (Parlett and Hamilton) and a curriculum developer (Dalton). Because of the model of curriculum development adopted by the "Geography for the Young School Leaver" project team, of which he was a part, Dalton was sensitive to reinterpretations of the project materials by individual teachers. Nevertheless, both statements suggest that the perceptions of teachers of their role, the circumstances of their work and the materials available to them are all crucial in determining the activities which take place in their classrooms.

Both Dalton and Parlett and Hamilton were commenting on the use of materials provided within the context of major curriculum development projects. For the present writer and the majority of his professional colleagues who are not involved in nationally funded curriculum development projects, the geography curriculum is a matter to be decided within the context of individual schools, and is based on materials which are usually selected from text books which either already exist within the school or are purchased from amongst those on publishers' lists. For such teachers, the "instructional system" is an ad hoc arrangement which varies from school to school and from one extreme to the other of:

i) a single sheet of paper on which is listed a number of 'topics' to be resourced and taught at the discretion of individual teachers;
ii) the adoption of a single text book series containing a 'course';
iii) a carefully constructed curriculum such as is suggested by Graves (1979).

Parlett and Hamilton (1976) draw a distinction between the "instructional system" and the "learning milieu". The latter they define as the:

> "... social-psychological and material environment in which students and teachers work together. The learning milieu represents a network or nexus of cultural, social, institutional and psychological variables. These interact in complicated ways to produce, in each class or course, a unique pattern of circumstances, pressures, customs, opinions and work styles which suffuse the teaching and learning that occur there. (p. 90)

These writers acknowledge that amongst the many factors influencing the learning milieu are:

i) the institutional constraints on the organization of teaching in schools,
ii) the assumptions held by teachers on the nature of curricula and teaching methods,
iii) the individual teacher's characteristics such as teaching style, experience, professional orientation and private goals and student perspectives and preoccupations.

While suggesting that the learning milieu is of great significance in the evaluation of curricular changes, especially those initiated through the introduction of new instructional systems, Parlett and Hamilton do not consider the influences of instructional systems on learning milieux.

The present writer, being interested in the role of text books, decided to examine the relationship between text books, as important elements of the instructional system in use in many geography classrooms and the way in which text books are used by teachers in their everyday work, as symptomatic of the learning milieu.

At the time the study began, it was the writer's contention that the style of teaching adopted by individual teachers was strongly influenced by the text book materials available. He further considered that providing a teacher with text books in which certain modes of data presentation and certain types of questions and activities predominated would have a major influence on the style of teaching adopted.

He therefore set out to investigate the nature of the interrelationship between text books and teaching, both from the point of view of the ways in which teachers select from and reinterpret the authors' messages as presented in their text books and from the point of view of the effects different styles of text books may have on teachers' approaches to their role.

The writer had already conducted an examination of the various sources of advice given on the use of text books. Such sources included:

i) Forewords, Prefaces and Introductions to text books,
ii) references to text books in manuals of geography teaching,
iii) "Teachers' Guides" produced to accompany text books, and
iv) comments of writers of official reports.

A list of the sources examined is giaven in Appendix A.

This examination revealed considerable variability in the advice offered to teachers on the use of text books. It showed that comments in authors' "Forewords" frequently refer to the factual content of the book and the way it is structured, but until the 1970s, rarely made mention of learning and teaching strategies.

There appears to have been a close relationship over time between the style of text books and the teaching strategies and perceptions of school geography prevalent at the time of publication. Despite this relationship, few text book authors have been prescriptive about the use of their books. Even those who, in the 1970s, wrote Teachers' Guides, tended to suggest that despite the authors' advice, teachers were free to use the materials as they saw fit. Study of manuals on geography teaching reveals that scant attention is given to the use of text books. Where mention is made, it tends to be dismissive of the value of text books in geography teaching. Rather, emphasis is given to the preparation of original lessons using a range of materials and resources.

A review was made of research studies pertaining to text books and the modes of data presentation through which text book authors convey their messages. These modes include text, photographs, maps, diagrams, graphs and tables of figures. This revealed that while little is known of the ways in which text books are used, the majority of studies have investigated the effectiveness of the modes of data presentation individually or in combination to answer such questions as "Are photographs effective in helping pupils to learn?" or "Do photographs help pupils to learn the subject matter of the text?" Other studies have investigated the ways in which pupils learn from specific modes of data presentation. By virtue of their narrow focus, both these approaches appeared to bear little resemblance to the teaching situation in the majority of secondary schools.

Baumgart (1977) states that:

> "The enigma is that the more control a researcher exerts in an experimental classroom, the less likely is that classroom environment to resemble the real world. That is, the greater the internal validity, the less the external validity."
> (p. 118)

In order to achieve a high level of external validity, it was decided to investigate the role of text books in geography classrooms using illuminative case study methods. Ten teachers of geography were selected and asked to participate in a detailed study of the role of text books in their teaching and the responses of their pupils to the text books and teaching strategies based on their use.

The text books used by the participating teachers were analysed to discern their structure in terms of their use of the six modes of data presentation, their suggestions for questions and activities and their readability levels.

The contribution of the text books to the style of teaching of the participants was examined in four ways. Firstly, the teachers were invited to maintain structured diaries of their geography lessons with selected classes. They were asked to record the ways in which the six modes of data presentation used by most geography text book authors and those authors' suggestions for questions and activities to be attempted by pupils, contributed to each lesson. Secondly, the teachers were requested to make audio-recordings of some of their lessons. Thirdly, the pupils in the selected classes were asked to complete a questionnaire which investigated their perception of the level of use made of the six modes of presentation by their text book authors, their perception of the level of use made of the modes in their geography lessons, their assessment of these modes in terms of their value for learning and their assessment of fourteen teaching strategies commonly adopted by teachers in which text books may be involved. Finally, the evidence collected by these three instruments was presented to the teachers as the basis for an interview in which the teachers were invited to discuss the extent to which they felt that the instruments had been effective in discerning their pattern of text book use. The reasons for their selection of text book materials for use in lessons were also discussed.

The findings of the text book analyses, teachers' diaries, audio recordings and pupil questionnaires are described in detail in Chapter Four. A record of the interview is also presented in this chapter.

In Chapter Five, interpretations of these studies are offered in three ways. Firstly, the reader is invited to judge the validity of the study in terms of the extent to which he or she can empathise with each of the teachers in their endeavours and understand the reasons for their actions. It is the prerogative of the reader to indulge in this approach. Secondly, the case study researcher offers his own interpretations of the studies reported here in order that readers may consider their own understandings in the light of his comments. Thirdly, the accounts are examined in the light of the wider research reviewed in Chapter Two in an attempt to generate explanations which make more general sense of the sets of events described.

As a result of the second and third approaches described above, the writer draws general conclusions about the contribution of text books to geography teaching and possible implications of these findings for further research and curriculum development in geography.

CHAPTER TWO

A REVIEW OF THE RESEARCH PERTAINING TO TEXT BOOKS IN GEOGRAPHICAL EDUCATION

I. THE STRUCTURE OF THE REVIEW OF RESEARCH ON THE ROLE OF TEXT BOOKS IN GEOGRAPHY TEACHING

A study of the various reviews of research into geographical education: those of Scarfe (1949), Jay (1960), Long (1964), Price (1970) and Naish (1972) for Great Britain, and that of Saveland and Parnell (1978) for the United States, and the various indices of journal articles and research reports, reveals that text books in Geographical Education have received very little specific attention. Even when the field of study is broadened to include other subject areas, the volume of research remains small.

There is a considerable body of research into the presentation, use and effectiveness of the various modes of transmitting information in the printed format, that is, text, photographs, maps, graphs, tables and diagrams. Much of this research has been carried out by workers from backgrounds other than in geography, and Naish (1972) has noted an increase in psychology studies amongst geographers. When the role of text books is the main focus of study it is necessary to examine studies carried out in a wide range of research areas. The need to look beyond research studies in geographical education is made more acute by the inclusion of geography within broad social studies courses in much of the literature from the United States.

The wide range of research studies which have examined features common to text books including those used in geography will be reviewed in the following sections:

I. Studies of text books in geography teaching
II. Studies of text books in subjects other than geography
III. Research on learning from specific modes of printed communication (text, photographs, diagrams, maps, charts, graphs and tables of figures)
IV. Research on the effects of differences between individual learners on learning from text books.

The many areas of research which contribute to a study of the role of text books in geography teaching are shown in Figure 1.

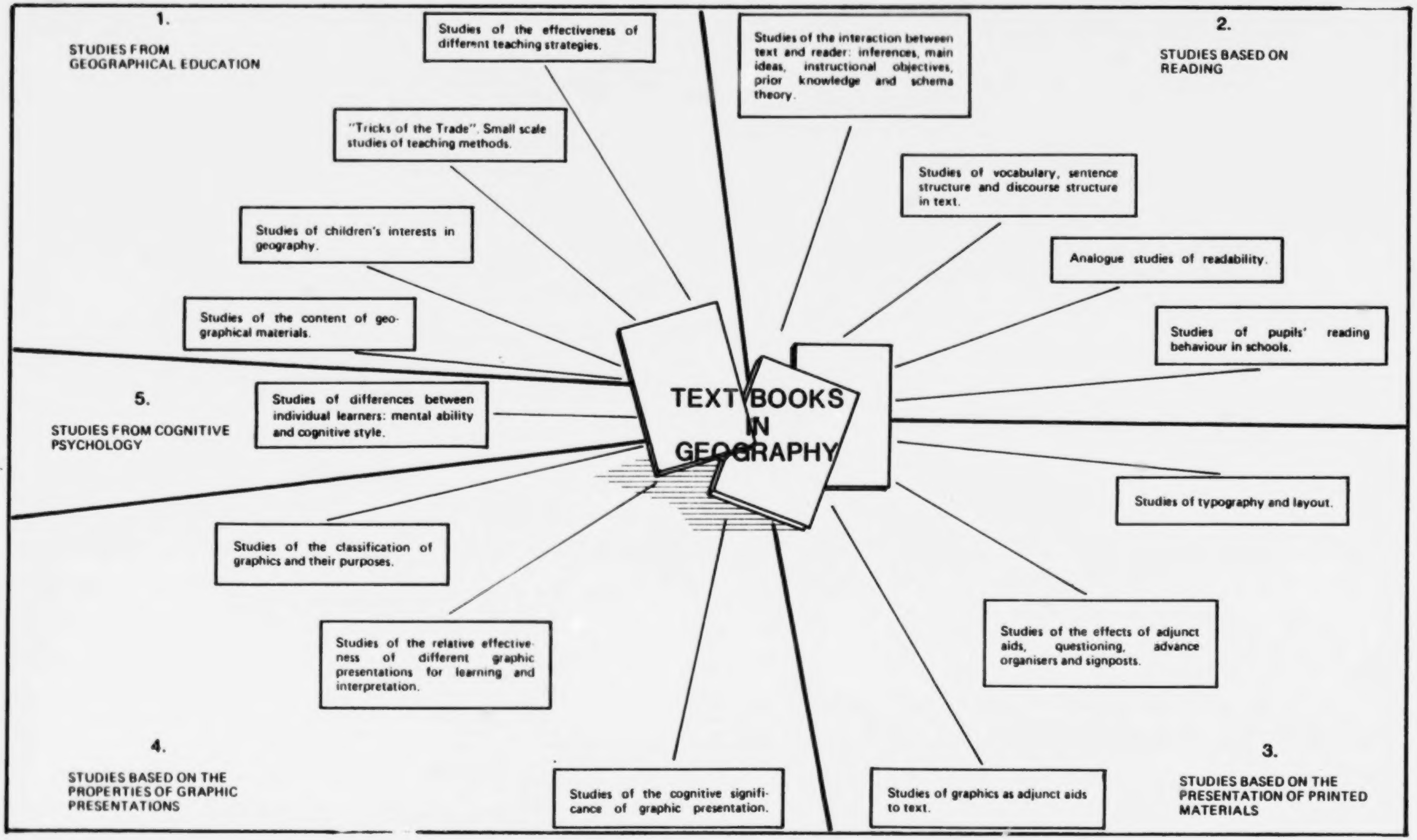

1.
STUDIES FROM GEOGRAPHICAL EDUCATION
Studies of the effectiveness of different teaching strategies.
"Tricks of the Trade". Small scale studies of teaching methods.
Studies of children's interests in geography.
Studies of the content of geographical materials.
Studies of the interaction between text and reader: inferences, main ideas, instructional objectives, prior knowledge and schema theory.
2.
STUDIES BASED ON READING
Studies of vocabulary, sentence structure and discourse structure in text.
Analogue studies of readability.
Studies of pupils' reading behaviour in schools.
5.
STUDIES FROM COGNITIVE PSYCHOLOGY
Studies of differences between individual learners: mental ability and cognitive style.
TEXT BOOKS IN GEOGRAPHY
Studies of typography and layout.
Studies of the classification of graphics and their purposes.
Studies of the relative effectiveness of different graphic presentations for learning and interpretation.
Studies of the effects of adjunct aids, questioning, advance organisers and signposts.
4.
STUDIES BASED ON THE PROPERTIES OF GRAPHIC PRESENTATIONS
Studies of the cognitive significance of graphic presentation.
Studies of graphics as adjunct aids to text.
3.
STUDIES BASED ON THE PRESENTATION OF PRINTED MATERIALS

Fig. 1. The areas of research which contribute to a study of the role of text books in geography teaching

II. STUDIES OF TEXT BOOKS IN GEOGRAPHY

REFERENCES TO TEXT BOOKS IN EARLY RESEARCH IN GEOGRAPHICAL EDUCATION

Scarfe (1949), reviewing research in geographical education before 1945, recognized three types of study: those pertaining to

A) tricks of the trade;
B) psychological factors
C) the interests of children.

A. Tricks of the trade

Scarfe defined such studies as those small experiments made in the classroom to improve the technique of the teacher. Such studies accepted the content of the subject as fixed and tried to speed the learning process.

No mention of the use of text books appears in any of the early articles based on such practical experience and experiments in the classroom, although the **Classroom Teacher** did carry regular reviews of "Recent School Books" from Volume 1. No. 2. (February 1902). The absence of such articles does not indicate that methods of teaching and presenting information were not studied at this time, since **The Geography Teacher** Vol.1. No. 1. (1901) included "The Use of Maps in Geography Teaching" by A. W. Andrews and "Photography as an Aid in Teaching Geography" by C. C. Carter, while Starr (1936), Going (1938) and Fairgrieve (1932 & 1946) reported studies of the value of radio lessons and films. Wilson (1934) reported an experiment "to compare the relative value of the three important methods of pictorial illustration, viz. film, slide and group photograph method" from which he attempted to discover "whether the facts and data had been memorized". This study is of interest here for its concern with teaching method, its implication that the memorization of content is of prime importance and its neglect of the text book as an "important" source of pictorial illustration.

B. Psychological factors in Geographical Education

This type of study was typified by Scarfe as:

"investigation into specific geographical abilities and achievements. It took the form of strictly scientific analyses of the abilities and mental processes which the child needs in order to succeed in geography."

Scarfe cited studies such as those of Burt (1917) which showed that "geographical ability" correlated most highly with history, English and science. These results were supported by H. G. Stead (1923), W. B. Chivers (1925), J. H. Wilson (1933), Burt himself (1939) (when he added that the ability to learn geography was highly saturated with what he called "general educative ability" or "general intelligence") and F. M. Earle (1944).

In 1935, M. Ormiston produced tentative evidence of the existence of specific spatial factors while in 1936, J.E. Daniel suggested that verbal intelligence was an important factor and that memory played a large part in learning geography. In 1940, C.L. Heywood confirmed these findings and found evidence to suggest that map-reading activities require mental skills different from those required in a study of regional geography. It is significant that none of these researchers related their findings to the teaching and learning methods associated with various subjects but rather attributed the factors they elicited from their largely statistical data to the specific abilities of the pupils.

C. The interests of children in Geography

Scarfe's third "phase of research", that concerned with the interests of children, began a trend which has continued to the present day and represented a change "which definitely shifts the emphasis from the subject of geography to the children who learn it" (Scarfe, 1949).

The earliest recorded study of this type was that by Fairgrieve (1926) who studied the views of 10,000 pupils towards different aspects of the subject, their ability to understand the subject as then taught and their liking for the subject as a whole. A similar study was reported by E. W. Jones (1933), but neither of these studies investigated pupils' preferences among the various possible teaching methods. D. Jordan (1937) and B.M. Swainson (1939) concentrated on children's attitudes towards geography, its content and methods. These studies showed that while geography was a popular subject, pictorial and practical activities were more popular than note taking. While neither of these studies made specific reference to text books, Swainson's list of activities in geography lessons (Figure 2) includes "Reading to yourself", "Writing notes" and "Finding out things" which may have referred to text book usage, although this was not made clear.

1. Films;
2. Drawing maps;
3. The lantern;
4. Stories;
5. Geography visits;
6. Wireless lessons;
7. Model making;
8. Reading to yourself;
9. Being read to;
10. Studying pictures;
11. Writing notes;
12. Map study;
13. Drawing diagrams;
14. Finding out things;
15. Writing compositions.

Fig. 2. The order of popularity of activities in geography lessons (after B.M.Swainson, 1939)

Among the first to pay specific attention to text books was D.B. Bartlett (1948) who commented:

> "The text book as used in geography teaching has not been the subject of much research, yet as one of the most common aids to teaching geography,it should possibly have done so". (p. 106)

Bartlett compiled a list of 15 teaching methods in order of popularity, of which the least popular activities included "Answering from textbooks" and "Reading to yourself from text books". (Figure 3)

1. Geographical visits;
2. Films;
3. Discussion method;
4. Outdoor map study;
5. Specimens and pictures;
6. Wireless lesson;
7. Group work;
8. Studying pictures;
9. Writing notes;
10. Map drawing;
11. Questions by the teacher;
12. Individual work;
13. The lecture method;
14. Answering from the textbook;
15. Reading to yourself from the text book.

Fig. 3. The order of popularity of activities in geography lessons (after Bartlett, 1949)

As a result of his study, Bartlett suggested that:

> "the elements which cause a teaching and learning method to be liked are reality, activity and the possibility of co-operative work, and those which cause dislike are verbalism, having to sit still and having to work in isolation. At all ages, they mentioned interest or lack of interest as affecting their likes and dislikes.......the text book needs investigation from this point of view. (p. 211)

Long (1971) investigated the attitudes of 1800 boys and girls aged 13 - 15 years to twenty-five "workaday activities commonly carried on in geography lessons". The list of activities is given in Figure 4. With some exceptions she found that the text book as a source of activity was generally unpopular. "Copying maps from the text book and atlas", was particularly enjoyed by third and fourth year girls destined for C.S.E. or non-examination courses, and "writing answers to questions using the text book to help" held considerable appeal for potential C.S.E. and non-examination boys and girls. The dislike of text books became stronger with increasing age for both girls and boys. With the exception of item 4, "copying maps", all the other text book related activities were of low interest to older and more able pupils.

1. Copy maps from the board;
2. Write dictated notes;
3. Fill in outline maps;
4. Copy maps in textbook and atlas;
5. Draw your own maps;
6. Study O.S. maps;
7. Draw objects like a cotton boll;
8. Draw your own pictures;
9. Draw a sketch from a picture;
10. Draw sections;
11. Write essays;
12. Write a story;
13. Copy notes from the board;
14. Take notes from the textbook;
15. Do textbook questions;
16. Write about what you have learned;
17. Read the text book;
18. Answer teacher's questions in class;
19. Label diagrams;
20. Draw graphs;
21. Study a map and picture of a single farm;
22. Do worksheet exercises;
23. Study geography in the streets around the school;
24. Do your own project;
25. Work in a group.

Fig. 4. Workaday activities in geography lessons (after Long, 1971)

Lidstone (1977) analysed the activities suggested by the authors of the Oxford Geography Project text book series and discerned nine major types of pupil activity. He investigated the attitudes of second and third year pupils in a south London comprehensive school to these nine major activity types (Figure 5).

A) studying theoretical plans or models;
B) reading and writing descriptions of problems facing other people;
C) playing geographical games;
D) taking part in dramatic simulations;
E) finding out information from graphs, tables or maps;
F) drawing graphs;
G) using mathematical methods of describing features studied in geography;
H) drawing maps of the distributions of various features;
I) working out possible solutions to problems facing other people.

Fig. 5. The types of pupil activity discerned in the Oxford Geography Project text book series. (Lidstone, 1977)

The study revealed that second year pupils recorded their least favourable scores for "reading and writing descriptions of problems facing other people" (Group B) and for "drawing maps" (Group H) while expressing greatest enthusiasm for simulations (Group D). Third year pupils were least enthusiastic about exercises involving mathematical methods of analysis (Group G) and those requiring them to suggest solutions to problems facing other people (Group I). Third year pupils placed their greatest value on simulations (Group D) and drawing graphs (Group F). No attempt was made to measure the pupils' reactions to the text books.

2. THE TEXT BOOK IN THE TEACHING OF GEOGRAPHY

Roberson (1961), as part of an enquiry into the degree of understanding and appreciation of geography reached by children aged 14 - 15 in secondary modern schools, investigated the views of practising teachers in order to obtain a 'working definition' of geography in schools. His reports of the ways in which text books were used by his sample teachers demonstrated yet again the low esteem in which they are held:

> "…. Miss A.: experienced teacher between 50 and 60… text book used when convenient, but on the whole very little".
> "…. Mrs C.: Young and capable with several years experience….. Text book little used in class but all children did homework which was usually in the form of notes, maps or essays based on the text book"
> "…. Mr D.: Senior assistant master, an experienced teacher …. very much of the old school…. did not attempt detailed studies,being more concerned with a wider review of the world. This type of syllabus resulted in little use of the text book"

Price (1970) reviewed research in geographical education, placing particular emphasis on those studies pertaining to teaching method, and suggested that more research had been conducted into those teaching methods which were listed as being popular with children on the Bartlett (1948) list. He designed a study to compare three teaching methods: the discussion method, involving oral questions and answers; the lecture method, in which no oral contribution was expected from the pupils; and a "silent method".The study revealed that the discussion and lecture methods were generally more effective than the silent method, as well as being more acceptable to the pupils.

Price's work raises several issues concerning the use made of the text books. Firstly, Price selected children for the silent group from among those who "would accept the stringent conditions imposed by the formal teaching methods demanding exclusively individual work for a lengthy period of fifteen lessons". Secondly, although Price claimed that the children were allowed to learn for themselves "in a teaching situation in which the sole function of the teacher was to maintain or insist upon complete silence" (p. 126) the teacher was exerting considerable control over the pupils' interactions with the text book through duplicated sheets of activities and instructions. Finally, Price made no attempt to analyse the text books used or to ensure their suitability for the pupils being studied.

3. THE ROLE OF THE TEXT BOOK IN GEOGRAPHY CLASSROOMS.

Three other studies have investigated the place of text books in geography teaching as part of other research.

Hicks (1980a), as part of his study on Images of the Third World and Multi-Ethnic Britain, attempted to discover which text books were actually in use in a sample of schools in Cumbria and the Greater Manchester area and the relative importance of text books in geography teaching about Third World issues and the plural nature of British society. Well over three-quarters of his sample of 103 teachers described text books as very or quite important in their geography teaching. Lunzer and Gardner (1979) edited the final report of "The Effective Use Of Reading" project for the Schools Council. The research performed as part of this project included studies of "The Incidence and Context of Reading in the Classroom" by Dolan, Harrison and Gardner, and "Reading for Homework" by Cole and Lunzer.

The pupils chosen for specific study were all of average or above average ability in the view of the class teacher. Unfortunately for the purposes of this study, the report did not differentiate between geography and other social studies, although from comments made by the researchers elsewhere in the book it may be safely assumed that geography lessons played a major part in the research.

The survey showed that reading (defined for the purposes of the observation schedule used as 'fixating a printed or written source') occupied 15% of the time of first year secondary and 16% of the time of fourth year secondary pupils, compared with, for example, 26% and 24% respectively for 'listening' (Lunzer and Gardner, 1979, p. 120). More specifically, of the time spent reading, first year secondary pupils devoted 34% of their time to text books while fourth year secondary pupils devoted 42% of their time. The comparable figures for English, maths, science and social studies show that only in science do pupils spend less time in reading than in social studies. (Lunzer and Gardner 1979,p. 123). Furthermore, the research also showed that for first year secondary pupils, 88% of reading and for fourth year secondary pupils, 86% of reading occurred in bursts of less than 30 seconds. (Lunzer and Gardner 1979, p. 125). In attempting to explain this pattern of fragmentary reading, the researchers suggested three standard classroom procedures:

i) a pupil reads a short question from a text book, workcard or the blackboard prior to answering it;

ii) using resource materials, a pupil will fixate on a key phrase or sentence which is copied into an exercise book or project file. The search is rapid, the process of copying involves frequent short references to the original material;

iii) answering literal questions results in a similar reading strategy. The pupil skims a text to find appropriate answers.

The researchers commented that such 'short burst' reading was unlikely to provide pupils with an adequate means for developing a critical or evaluative approach. Regarding classroom use of text books, they concluded:

> "At the outset of this project, we believed that reading was widely used in the classroom and that teacher expectation of possible reading outcomes would probably be high. What we have found tends to deny both these hypotheses. In most lessons, reading for learning seems to have a relatively minor role. Equally, teachers are generally realistic. They know that many of their pupils gain little from unsupported reading and they are more surprised by the successful reader than the unsuccessful." (p. 137)

The research also showed that a substantial number of homework assignments in social studies entailed more than ten minutes reading. The figures increase for fourth year secondary pupils. The study also investigated the purposes for which reading was required as part of homework assignments. Eleven possible purposes were presented to both pupils and teachers. These are presented in Figure 6:

1) test preparation;
2) revision;
3) to do questions;
4) to find out answers;
5) to prepare for lessons;
6) to make notes;
7) to check work;
8) to do corrections;
9) pleasure;
10) to follow up lessons;
11) other.

Fig. 6. Possible uses for textbooks (after Lunzer and Gardner, 1979)

The researchers found that first year pupils read text books relatively little, while fourth year pupils relied on text books to a considerable extent (Lunzer and Gardner 1979, p. 153).

The data from these surveys showed that the teachers observed rarely relied upon reading for learning in lesson time, although when they did text books were commonly used. Frequently reading was expected as homework, with the importance of text books increasing closer to public examinations.

In the United States, Schallert and Kleiman (1979) investigated "Some reasons why teachers are easier to understand than text books". These researchers took four samples of social studies textual material and presented them to a group of ten teachers as the basis for classroom presentations. The teachers were then tape recorded and observed as they engaged their pupils in a lecture with discussion, complete with pupil questions, responses and comments. By comparing the written presentation with that of the teacher, Schallert and Kleiman identified a number of general advantages that teachers have over text books in getting children to understand and remember the material presented to them. Schallert and Kleiman concluded that, to become successful at learning by reading, children must learn to understand material that is not as well adapted to them as teachers' presentations may be. They must internalize the processes of focusing attention, picking out the main points and integrating the new information with relevant prior knowledge. Finally, they must determine on their own whether they have understood a text and what to do if they have not. On the other hand, teachers can tailor their presentations to the pupils' background and level of understanding, provide external attention focusing and comprehension monitoring, and remind the pupils of relevant information they already possess. They stated that although the level of teachers' use of these potential advantages is not known, all the teachers in their sample made some use of them.

4. CONTENT ANALYSES OF GEOGRAPHY TEXT BOOKS

The literature on content analysis of text books reveals that:

i) Most of the literature emanates from North America and relates to North American examples.

ii) Much of the American research refers generally to text books in the Social Studies area, making it difficult to extract data referring to geography books from those relating to other social studies areas.

iii) Much of the research refers to areas which are of current political significance.

In this account, only that research which relates to geographic material has been described, although it is appreciated that in some areas, such as those relating to gender-bias, this distinction is rather forced.

The greater emphasis placed on content analysis in the United States compared to the United Kingdom may be attributed to three major factors:

i) In the U.S.A., text book adoption is often in the control of interested parties outside the school community.

ii) The U.S.A. has a history of vocal minority groups wishing to emphasize inequalities within the educational system.

iii) Traditionally, greater importance has been attributed to text books in influencing the curriculum in the U.S.A. than in the United Kingdom.

Leeper (1965) stated that:

> "The teaching of both controversial topics and basic subjects usually originates from text books and text materials. Text books become the key to curriculum development and implementation through dissemination to teachers and students." p. 5)

Public concern about text books has led to a number of text book adoption committees publishing documents with such titles as "What every child should know: Social Studies Course of Study Criteria for Text Book Selection" (Arizona Dept. of Education, 1983), in which it is stated:

> "This document serves a dual purpose. It shall:
> a) constitute the course of study for the subject contained therein;
> b) be used as the educational content criteria for the selection of state adopted text books."

Such frameworks for text book adoption have led to considerable attention to text book content analysis within the United States. This is not to suggest that such studies have not been undertaken elsewhere, and reference to studies from the United Kingdom, Australia, Canada and Continental Europe will be made in the following summary.

The two areas which have received greatest attention from those content analysts who have considered text books in geography relate to the treatment of specific countries or continents and specific groups within the populations of various countries. There have also been studies into the treatment of political viewpoints as well as into the treatment of specific ideas and geographical skills.

A. The treatment of specific areas in text books

A number of studies have been made of the images of one country as presented in the text books used in the schools of another. In the United States, studies have been presented of text book treatment of Latin America (Perrone, 1965), The Middle East (Griswold, 1975), Egypt (Ziadeh & Allen, 1976), the Arab World (Jacobs, 1981), Africa (Wilson, A.H., 1980; Sullivan, 1980), Asia (the Asia Society, 1976), Russia and the Soviet Union (Mehlinger and Rabinowitch, 1981) and Japan (Kobayashi, 1981; Wojtan, 1981; and the Japan/United States Textbook Study Project, 1981; Japan, Williamson, 1984.) All these studies demonstrated a nationalistic bias in the materials in favour of the positive contributions of white Anglo-Saxon protestants to the areas of the world under study.

In Europe, Boden (1977) studied the potential for promoting international understanding through history, geography and social studies school text books in seven countries: France, West Germany, India, Japan, Kenya, Venezuela and the United Kingdom. This study found that, despite excellent quality of production in terms of format, layout and printing, many textbooks in all countries suffered from:

i) Inaccurate statements in the form of text, photographs and maps;

ii) Omission of basic and essential historical and geographical information on a country (as seen by the evaluator for that country);

iii) Misleading interpretations and opinions.

The Centre for World Development Education (C.W.D.E.) Geography Study Action Group has produced a review of the treatment of Third World issues in English text books based on the "scores" awarded by nineteen reviewers on a number of criteria presented as a check list (C.W.D.E., 1979). Gill (1982) has cast doubts on the validity of the exercise on two counts. Firstly, each book was reviewed by only one person with no attempt made to balance the contrasting ideological perspectives on development held by the various reviewers. Secondly, the simple aggregation of scores resulted in incongruities at variance with the findings of Hicks (1980a) whose methodology avoided the problems described.

Hicks (1980 a & b) investigated "ethnocentric bias in textbooks with particular reference to geography". The research was in two parts: an analysis of twenty commonly used text books on Third World themes and an analysis of the treatment of the multi-cultural element of Britain contained in fourteen British Isles text books used in the United Kingdom. The first part of the research enabled Hicks to produce three categories of text book identified by their position along two continua: the political-societal stance of the authors which he defined as ranging from "radical" through "liberal" to "status quo", and the extent to which racism could be discerned in their books. This analysis revealed that status quo-racist books are in the minority, but a similarly small proportion of books demonstrated a radical-anti-racist stance. Some workers have concentrated on bias in text books manifested in specific ways. Hawkins (1978) and Wright (1979) have investigated the ways in which misleading impressions may be conveyed by photographs in text books, while Wright (1981) calculated that 84% of the photographs of South Africa in seven books came from the South African Government Information Service or allied bodies. He suggested that this might lead to a biased presentation of South Africa. Wright and Pardey (1982) examined the statistics and statistical maps used to illustrate the section on South Africa in a single text book. In this latter study, Wright and Pardey showed that there is considerable distortion and inaccuracy in the text book they analyse, but concluded by suggesting that such a book could provide materials for teachers to use in pursuit of the aims of education as expressed in 'The School curriculum' (D.E.S. 1981):

> "... The first 'aim of education' is to 'help pupils develop lively, enquiring minds; the ability to question and argue rationally ....'. If a text book is treated not as the embodiment of gospel truth, but as a source for rational questioning and argument, we are helping to fulfil this. The ability to recognize bias of all types is a vital skill, for any work in this area helps to fulfil Aim 2 of the D.E.S.

> booklet: 'To help pupils acquire knowledge and skills relevant to adult life .....'. And when, as here, the book seems to offer a 'white ' viewpoint, any attempt to fulfil Aims 1 and 2 will result in some attention to Aim 6 as well: 'tolerance of other races, religions and ways of life'. (Wright & Pardey, 1982, p. 43 & 44).

Wright and Pardey are almost alone amongst the content analysts of school text books to acknowledge that the use to which the text book is put in the classroom may influence the judgement which should be made of it.

B. The treatment of specific groups within a population

The late 1960s and 1970s saw the publication of a large number of articles on the way in which the black population of America was portrayed in, and could relate to, social studies text books. Of these, a number were based on detailed content analyses. Harris (1969), Banks (1969), Turetsky (1974) and Zimmerman (1975) studied the way in which negroes are referred to in text books, while Price and Spencer (1970) and Donaldson (1971) studied the ways in which negro children could relate to text books. Donaldson defined the approach taken by geography texts to black Americans as the '4-D approach: distortion, deletion, denial, dehumanization'.

Yawkey (1973) studied the ways in which white children's perceptions of black Americans were influenced by social studies materials. However, Yawkey makes no mention of the ways in which the materials were mediated to the children by their teachers or their study programmes.

Studies of the place of other groups in text books have been undertaken by the Indian-Eskimo Association (1970),and the Michigan State Department of Education (1972) while Hata and Hata (1974) studied the place of Asian Americans in Californian education.

Nowhere in the North American literature of content analyses is there any comment on the presentation modes of the materials in the classroom.

In the United Kingdom, Hicks, (1980a, 1981), analysed the treatment of blacks in fourteen text books on the British Isles. He concluded that they largely reflect the view of traditional geographers who see multi-ethnic Britain as outside the boundaries of school geography.

Bias against women has been investigated in the United States since the early 1970s. O'Donnell (1973) examined Primary social studies texts while Weitzman and Rizzo (1978) conducted a study on sex bias in humanities text books and found that, in illustrations, male figures dominated and usually assumed positions of importance and authority as opposed to female figures.

The special issue of **Journal of Geography** on "Women in Geographic Curricula" (Vol 77, No. 5, 1978) included various discussion articles relating the women's movement to geographic curricula, including suggestions for specific courses designed to de-emphasize what is seen by some authors as the overly male orientation of existing courses (Deatherage-Newsom, Wilkinson, Berman, Libbee & Libbee, Lee, 1978).

Only two authors reported research projects. Monk (1978) analysed a selection of role-playing activities and simulation games for their use of men and women in the images presented. She concluded that women in games in geography usually have relatively minor roles and do not regularly have the opportunity to exercise power or influence in decision making or spatial conflict other than as citizens, lobbyists or members of local governments.

Larimore (1978) analysed geography text books current in 1976 and discerned both a predominance of male images in depicting cultural geography and a predominantly abstract style of presentation.

In the United Kingdom, Bale (1982a) referred to a number of articles on sexism in children's fiction, but failed to discover any content analyses which referred to sexism in geography text books. In 1984, the findings of a working party set up to examine equal opportunities and sexism in geography were reported (I.L.E.A., 1984). The working party examined a number of geography text books and concluded that "there is a worrying degree of sexism apparent in geography texts" (p. 25). The working party suggested that books which use "line drawings and sketches rather than photographs offer greater scope for showing a more balanced view of male and female roles". They acknowledged a number of dilemmas in achieving an unbiased approach and pointed out that in some texts the imbalance between illustrations showing people and those without people was even greater than that between male and female illustrations.

C. The treatment of specific political viewpoints

Some studies from the United States have examined the presentation of particular political stances. Peiser (1973) investigated the coverage of 'Population' in High School text books while Fleming (1981) examined "The Impact of Nationalism on World Geography Textbooks". Fleming concluded that these text books were not blatantly propagandist.

D. The treatment of specific ideas and skills

There have been a number of studies of individual areas of the geography curriculum. Bjork and Farren (1972) and Kwitman (1974) have examined the treatment of 'Population' in social studies. The former authors found that the subject of population appeared in less than 40% of books published before 1950; in 75% of those published between 1950 and 1965 and in almost all books published since then. They commented on the predominance of emphasis on the passive concept of demographic transition with little mention of active birth control. This was interpreted as evidence of U.S. faith in technology and progress to cure all ills.

Jackson (1976) studied forty-four American geography text books published from 1900 to 1970 to determine the degree to which outmoded ideas persisted in high school geography books. He concluded that environmental determinism persisted in secondary level geography texts for at least twenty years after it was abandoned as a central theme at university level. He attributed the continued reliance of teachers on text books to five reasons, including unfamiliarity with more innovative materials, financial restrictions, heavy teaching loads, the limited backgrounds of the teachers which forces them to rely on 'canned' materials and the unwillingness of school districts to abandon traditional texts. No evidence to support these contentions was presented.

Hawkins (1977) investigated the map and globe skills component of three series of social studies text books for the six to eleven year age range. He found that each of the three series of books concentrated on such skills as locating specific places, identifying map and globe terms and using the key to translate symbols and get information, while paying little attention to co-ordinates, directions and time differences. Hawkins also demonstrated an almost complete lack of progression and skill development through each of the series. He appealed for a more systematic approach in text books, emphasizing the progressive nature of map and globe skills, but commented that this "is of limited usefulness ..... if the fourth grade teacher follows the scheme and the second and third grade teachers do not".(p. 265)

Selkirk (1981) performed a qualitative content analysis on the mathematical ideas presented in three series of British geograpy text books. Selkirk commented on the accuracy with which the authors had applied the mathematical techniques to their subject matter and their appropriateness for the age groups for which the text books are nominally intended. In the case of appropriateness, Selkirk suggested that:

> "From a mathematical point of view, it is difficult to judge books which the geographer may well use concurrently rather than consecutively." (p.184)

5. SUMMARY OF STUDIES OF TEXT BOOKS IN GEOGRAPHY TEACHING

Early research in geographical education included a number of small scale experiments on teaching method, while early research in the psychology of education concentrated on the relationship between specific abilities in individual subjects and a concept of general ability.

The first mentions of geography text books in research occurred in those studies which examined the interests of children in geography. Jordan (1937), Swainson (1939), Bartlett (1948), Long (1971) and Lidstone (1977) all found evidence that work based on text books was less popular with children than many other activities undertaken in geography.

Roberson (1961) found evidence that text books were not highly thought of by the teachers in his study. Price (1970) found that pupils in his study learned better through lecture and discussion methods of teaching than through using text books on their own, although methodological problems give rise to some doubts about the general applicability of his conclusions.

Lunzer and Gardner (1979) reported research which examined the uses made of text books in a number of subject areas. They found that much classroom reading was for short periods although the amount of reading pupils were expected to do for homework increased with age. Schallert and Kleiman (1979) found that pupils learn more effectively from teachers' presentations than from text books and explained this in terms of the teacher focussing pupils' attention and relating language to specific groups of pupils.

Much work has been accomplished, especially in the United States, on the content analysis of geography and social science text books. Although reports of the extent of bias in text books vary, only Wright and Pardey (1982) acknowledged that the classroom use of the books may influence the effects on pupils' thinking and attitudes.

In studies of specific ideas and skills, Hawkins (1977) showed that map skills in many United States elementary social studies text books lacked progression in skill development. Selkirk (1981) commented favourably on the way in which mathematical concepts were developed in British geography text books. Both researchers pointed out that progression in the text books is of little use if teachers and pupils use the books out of sequence.

The studies examined in this section have shown that text books in geography are generally held in low regard by both teachers and pupils. Teachers show by their actions that they have little faith in their pupils' abilities to learn from text books. Text books have been shown to vary in their objectivity and the ways in which they guide the conceptual development of pupils. Few studies were found which raise the issue of how text books in geography are actually used by teachers and pupils.

III. STUDIES OF TEXT BOOKS IN SUBJECTS OTHER THAN GEOGRAPHY

1. QUESTIONS AND OTHER LEARNING ACTIVITIES

Research into questioning strategies falls into three categories:

A. studies of questions asked by teachers verbally in classrooms;

B. studies into the effects of question type and placement in text books;

C. content analyses of question types in text books

A. Questions asked by teachers

A number of workers, primarily in the United States, (including Stevens, 1912; Yamada, 1913; Bellack et al., 1963; Flanders, 1963) have shown that much of the school day is filled with teacher talk. Similarly, Floyd, 1960; Flanders, 1963; Schreiber, 1967; and Moyer, 1966; have shown that the teachers in these studies spent most of their talking time in asking questions. When these questions have been analysed, it has frequently been found (Adams, 1964; Far West Laboratory for Educational Research and Development, 1967; Guszak, 1967; Davis and Tinsley, 1967;Sloan and Pate, 1966;Wilson, 1969; Tinsley, Watson and Marshall, 1970; Tinsley and Davis, 1971; Ruddell and Williams, 1972) that most questions are of the straight recall type and aim at the lower levels of knowledge as described in Bloom's Taxonomy (1956). Since all this research depended on question counts, it did not take into account the differences in time which might be devoted to the simple questions which required only very brief answers and questions drawing on higher levels of knowledge to which pupils might have taken much longer to respond.

There have been mixed findings in studies which have investigated the influence of different levels of questions on pupils' learning. Kleinman (1965) observed seventh and eighth grade science teachers and concluded 'that the high-ability pupils in the seventh- and eighth-grades, who have teachers that ask critical-thinking questions, have a better understanding of science, of scientists and of methods of science than the same calibre pupils of teachers who do not ask critical thinking questions'. Ladd and Anderson (1970) also studied science classrooms and found that students who had teachers who were placed in a 'high enquiry' group achieved higher test scores than students with 'lower enquiry' teachers. In social studies, Clegg and Sebolt (1970) and Buggey (1972) found that students exposed to higher cognitive questions attained higher achievement scores than students who had not been exposed to such questions. On the other hand, Allen (1970), Rogers and Davis (1970) and Willson (1973) found that the cognitive levels of teachers' questions have no effect on the cognitive level of pupils' answers nor on the retention of factual material.

B. The effects of question type and placement on learning

Much of the research into the effects of question type and placement on learning from written text has been undertaken by cognitive psychologists, frequently using passages designed especially for the research. Such research is reviewed in the section on learning from text, below.

C. Content analyses of question types in text books

In response to the work on teacher-initiated oral questions in classrooms, a number of workers have examined the frequency and type of questions which are included in school text books.

Leonard and Lowery (1976), Lowery and Leonard (1978a & 1978b) and Mayeda (1980) have shown that the proportion of questions to expository sentences in biology text books in use in the United States may vary considerably between books. This finding has been replicated in the United Kingdom by Carrick (1977).

In addition, Lowery and Leonard (1978a) and Mayeda (1980) investigated the positioning of questions within the text and discovered that there is again great variation between books as to whether questions are initiatory or terminal. They also found some books which relied heavily on contextual questions (questions positioned in the middle of a paragraph), while Mayeda also found questions in some books set in the margins and as captions to photographs and diagrams. There seems to be no research which has examined the effectiveness of placing questions in the margin or as captions. The effectiveness of other positions for questions in text will be examined in the section on question placement in 'learning from written text' below.

Davis and Hunkins (1966) examined fifth grade social studies textbook questions using Bloom's Taxonomy and found that higher order questions were all but disregarded. Lowery and Leonard (1978a) found that the most commonly used textbooks in biology classes in the United States relied heavily on questions which they described as "rhetorical, direct information or focusing". Again, Mayeda (1980) in the United States and Carrick (1977) in the United Kingdom have reported similar findings.

2. THE USE OF TEXT BOOKS OTHER THAN IN GEOGRAPHY IN THE UNITED KINGDOM

Gillard (1975) was able to show that reading ability as measured by Verbal Reasoning Quotient and Reading Quotient tests has no correlation with cloze scores on science texts. He drew no conclusions as to the significance of his other measures other than to point out that the high proportion of graphs, photographs and other modes of presentation in the books he analysed would imply a need for pupils to be taught how to use them effectively.

Carrick (1977, 1978) carried out a similar analysis of biology text books for first examinations, but added analyses of question type and frequency after the manner suggested by Leonard and Lowery (1976). Once again no comment on possible uses of the analyses was offered.

Gould (1977) found that a text book was used in the course of 60% of the lessons he observed. He also found that after their use as a source of information, with teacher support, the main use of the text book was as a source of illustrations. In none of the 104 lessons observed in 12 different schools were the questions or ancillary tables in the texts referred to, and instructions for experimental work were used only six times.

3. SUMMARY OF STUDIES OF TEXT BOOKS OTHER THAN IN GEOGRAPHY

The importance of questioning in the teaching styles of many teachers has been shown in a number of studies, especially in the United States. There is no agreement on the effects of questions at various cognitive levels on pupils' learning.

Content analyses have shown that text books vary greatly in both their positioning of questions and activities and the cognitive levels of these questions. There is some evidence that questions in text books are frequently of low cognitive levels.

No reports have been found in which studies of how teachers choose questions and activities for their pupils are reported.

IV. RESEARCH ON LEARNING FROM SPECIFIC MODES OF PRINTED COMMUNICATION

1. WRITTEN TEXT

A. Studies of written text per se

a) Introduction

Singer (1982) pointed out that over the past 30 years the emphasis on psycholinguistic research has developed from the word to the sentence and finally to the text. The writer acknowledges that this division is no longer deemed appropriate by researchers in the field of text comprehension, most of whom would now consider that to examine text in isolation from the reader and the knowledge, attitudes and intentions that the reader brings to the text is to misrepresent the purpose of written communication. This developmental structure has been adopted because it most readily accommodates research studies in both the language of the classroom and text books undertaken by subject specialists and the work of psychologists. It also permits the inclusion of a number of descriptive studies which have relevance to the study of text books but which lie outside the realms of linguistics and cognitive psychology.

The structure of this review has also been influenced by the fact that while investigations into the nature of the reading process have been undertaken with particular vigour in the United States, the present study relates to British classrooms. Since inter-cultural comparison of the social variables between the United States and the United Kingdom lies outside the scope of this study, emphasis will be placed on descriptive research from the British education system.

Peters (1982) pointed out the differences between research carried out with self-selected subjects in a laboratory and that with student subjects in an instructional setting while Hayes (1982), commenting on the 'limited focus that appears to be developing in reading research', wrote: 'Ignoring the subtle complexity of real-life situations may produce strong research generalizations, but generalizations that do not fit a context of reality'. Barr (1982) noted that it is only recently that documentation of classroom activity has been undertaken in a systematic fashion. She acknowledged the difficulty of relating the theoretical knowledge developed by researchers to the practical activities of the classroom.

McConkie (1977) emphasized the importance of distinguishing between research with an 'educational goal' (aimed at identifying the combination of variables which maximizes learning) and research with a 'psychological goal' (aimed at revealing information about the mental processes involved in learning). He suggested that if the educational goal is adopted, it is important for the experimenter to clarify learning objectives. In the case of the psychological goal of research, McConkie suggested that a distinction must be made between the subjects' 'normal' processing and what they do when highly motivated. In support of this contention, McConkie cited the work of Lahey, McNees and Brown (1973). He suggested that motivation factors are generally not a problem for short term laboratory studies but may be the major problem of education in the normal school situation. He further concluded that much research is not appropriate for investigating what people normally do as they read and listen. This was a conclusion also reached by Spiro (1975) who claimed that virtually all research which had been done on learning from text had failed to investigate the normal knowledge acquisition process.

In the review of the literature on learning from expository text which follows, an attempt has been made to examine those areas of linguistics and cognitive psychology which relate to the process of learning from textual materials and to select those conclusions which appear to have most relevance to the use of text books in the classroom. Where possible, descriptive research from the United Kingdom is related to the process studies.

b) Research into reading at the word level

Morris and Stewart-Dore (1984) have pointed out that unfamiliar vocabulary has long been recognized as a source of difficulty in reading. Most beginning reading schemes work on the basis of controlling new vocabulary. At higher levels, intelligence tests frequently include vocabulary sections and readability formulae invariably include some measure of word difficulty.

Perera (1979) has suggested that there are two main sources of difficulty for pupils' reading at the single word level. The first is when words which are familiar to pupils are used in unfamiliar ways; the second is when technical vocabulary is used.

Strange and Allington (1977) have commented that in content areas attention to vocabulary is generally restricted to the size of the technical vocabulary. They stated that this is a false distinction and have expressed a preference for examining conceptual difficulty and the ability to work out sound-symbol relationships (decoding ease) as predictors of student difficulty. They suggested that in estimating conceptual difficulty, a helpful indicator is whether a high frequency synonym could be found. In evaluating decoding ease, they suggested that familiarity and phoneme-grapheme regularity (the relationship between the look and the sound of the word) were critical factors. The combination of conceptual difficulty and decoding ease were used to determine three types of words that might need an introduction by the teacher prior to reading. These three types were: firstly, concept words with little or no decoding irregularity; secondly, non-concept words with decoding irregularities; and, thirdly, concept words with decoding irregularities.

Despite Smith's (1973) contention that vocabulary need not be introduced prior to reading since the reader will make use of contextual information to identify unknown words, Strange and Allington declared that while this may be true for many common words, it was not true for much of the vocabulary encountered in content areas. They stated that one of the primary roles of content area teachers was the development of concepts and the labels assigned to these and that often context did not provide enough information to ensure correct meaning or pronunciation. Finally, they cited LaBerge and Samuels (1974) who said that if a student is attending to the decoding of words it is safe to assume he or she will not be attending to the meaning. Perfetti (1977) has supported this contention, while Pearson and Johnson (1978) have stated that "vocabulary knowledge is a crucial precondition to comprehension" and Trabasso (1981) has added that "without understanding the basic concepts in the text or question, one cannot make inferential links".

Anderson and Freebody (1981) in their review of research discerned three differing views on the role of vocabulary knowledge in reading:

i) An instrumentalist view which proposes that vocabulary knowledge permits comprehension to take place. Mezynski (1983) and Becker (1977) see the instructional implications of this to be that in order to improve reading comprehension one should teach vocabulary.

ii) A verbal aptitude view, typified by Hunt (1978) who suggested that the link between vocabulary and comprehension is a function of a third factor: an ability for quick thinking. Mezynski (1983) cited LaBerge and Samuels (1974) and Lesgold and Perfetti (1978) who described this aptitude as an amalgam of skills in remembering word meanings and using these meanings efficiently in text processing. She said that the instructional implications are that practice is crucial in word acquisition so that words which have been explained and used become part of the student's repertoire.

iii) A knowledge hypothesis view, represented by the work of Adams and Collins (1979), Lesgold and Perfetti (1978) and Rumelhart (1980), firstly, that knowing a word well implies that one knows a lot of words and ideas related to it, and secondly, that this conceptually generated knowledge is combined with information in the text.

Mezynski (1983) warned that insufficient breadth of knowledge of word meanings could result from teaching words in a strict definitional sense. She cited research by Nitsch (1977) which indicated that restricted context learning limits the ability to use the words in novel contexts later and suggested that the instructional implications were that new vocabulary should be taught in the context of learning new subject matter.

Mezynski reviewed a number of studies which explored the effects of vocabulary instruction on subsequent reading comprehension and found that they suggested that it is relatively easy to increase pupils' word knowledge to the extent that they can give definitions, but pupils may then be in the position of knowing definitions yet be unable to use the words to comprehend textual information. She cited especially the work of Beck et al. (1982) who showed the importance of 'automaticity of lexical access",in other words, if the words are known but could not be accessed quickly enough, this might interfere with reading processes. Her conclusions were that, in the realm of increasing effective vocabulary, the three important variables were, firstly, the amount of practice given to the words, secondly, breadth of training given in the use of the words, and thirdly, the degree to which active processing of word meaning in a specific context is encouraged.

Perera (1979) cited work by Otterburn and Nicholson (1976) in which 300 secondary children's understanding of thirty-six common terms used in mathematics at C.S.E. level was investigated. They found that only fourteen of these words were understood by more than half the subjects. Similar results were reported by Johnstone (1978) who found that even where only one word in a chemistry question was altered, scores for the simplified questions were considerably higher.

Evans (1974, 1975, 1976) reported that in a sample of 294 school books in biology, little more than one quarter acknowledged a terminology problem by mentioning technical vocabulary in a preface or including a glossary. He also reported that more than two thirds of a sample of forty books on the methodology of science teaching were found to make no mention of terminology (Evans 1974). Evans (1976) commented that in a sample of O-level biology text books between 20% and 27% of terms were first explained after they had been used without explanation, and a high proportion of terms were used and never explained. He concluded:

> "To some extent teachers and text book authors work together, the former the dominant partner. It is therefore tempting to argue that a book need not carry an explanation of every term used because the teacher can remedy the deficiency."(p. 25)

This latter point has also been made by Prestt (1976) who pointed out that it is not possible for children to enter into a dialogue with a science work card on which they are working alone, and so does not have any way of making new terms and concepts their own.

Milburn (1972) investigated the number of 'geographical terms' used in geography classrooms over a five year period and in a sample of text books. He quoted Ervin and Foster's (1947) statement that 'where meanings differ, the child sticks to the most common meaning'. While homophonic terms were often difficult to separate from terms which were merely misread, it was found that concepts adequate for use at the primary level (e.g. "beach: the edge of the land near the sea") were often carried over into secondary education without further explanation.

Milburn concluded that, by the age of 16, pupils in his sample knew about 62% of the geographical terms used in schools. He commented that most of the technical terms he identified related to physical geography and may, therefore, be compared most closely to the scientific terms described by Evans. Finally, Milburn stated that the range of children's geographical vocabulary and their true understanding of it may be markedly different. He cited Luria (1961) who stated that both correct verbal expression and active experience should be encouraged as they help to consolidate learning.

Jarolimek (1971) in his investigations of vocabulary in social studies proposed a wider definition of technical vocabulary to encompass the whole range of social studies:

> "...words, terms, or expressions peculiar to social studies which will not be found when reading selections from other organized fields of knowledge. It includes a) figurative terms (iron curtain), b) words with multiple meanings (fork), c) specialized concepts unfamiliar to the children (civilization), and d) terms peculiar to a locality (gandy)." (p. 327)

Freeland (1977) investigated the effects of technical vocabulary, as defined by Jarolimek, on comprehension of social studies material by Mexican American students and a control group. He concluded that the technical vocabulary accounted for the lower scores of the Mexican-American subjects.

While the technical vocabulary referred to in the studies described above has caused problems due to its high level of specificity, some researchers have discovered problems due to the lack of specificity of some terms. Rushdoony and Sanders (1976) replicated an earlier study by Jarolimek and Foster (1959) into children's understanding of quantitative concepts in social studies text books. They found that students understood approximately half of the quantitative concepts in the text books. Rushdoony and Sanders concluded that:

> "more precise quantification of social studies terms in text

> books is needed if children are to understand quantitative terms and apply their meanings to the content of social studies." (p. 29)

c) Research into reading at the sentence level.

Perera (1979, 1980) has suggested that there are three basic reasons why some forms of grammatical construction can cause problems for pupil readers.

Firstly, there are some sentence patterns which do not occur frequently in speech and so the reader is not able to predict what might be coming next. Perera (1979) cited work by Peltz (1974), Reid (1972), Ruddell (1965) and Tatham (1970) which showed that children read more easily those sentence structures that they would themselves say or write. Perera (1980) cited work by Fagan (1971), Malicky (1976) and Theberge and Braun (1977) which showed that passages with a great deal of elipsis may receive a score on measures of readability that suggest that they have a low level of difficulty while in fact presenting many problems for young readers. Furthermore, Reid (1972) demonstrated that young readers tend to misinterpret sentences with concealed negatives with positive meanings and complex conjugations such as 'not only .... but also'.

Secondly, Perera stated that one of the important roles of intonation in speech is to divide utterances into grammatically relevant word groups. In writing, this source of information is lost and punctuation serves to demarcate only some of the large grammatical units. She cited Fodor and Garrett's (1967) finding that omitting relative pronouns causes confusion.

Thirdly, some constructions, which are relatively easy for a normally skilful reader to interpret, are difficult for a slow reader because reading slowness prevents the whole grammatical constituent from being perceived as one unit.

Perera concluded from the work of Miller (1956) and Taylor (1975) that the average twelve year old can hold some ten to thirteen words in short term memory. She suggested that, if a reader is reading at a slower speed than the average for his or her age then he or she will be able to store fewer words. From this she concluded that if a grammatical constituent is longer than the reader's short term memory capacity, or if it is interrupted by another construction that exhausts the storage space in short term memory, the reader will have to struggle to make sense of the passage.

Perera (1979) also cited Kucera and Francis (1967) who showed that the average sentence length for general fiction is fourteen words and for 'learned and scientific writings', twenty-four words. Since sentences in school geography text books frequently exceed thirty words (Perera 1979, Lidstone 1977) sentence length alone can place a considerable burden on young readers.

Kaiser et al. (1975) and Wang (1970), cited by Perera (1979), have shown that sentence length alone need not increase reading difficulty. Kaiser et al. concluded that 'when sentence length is held constant there is still a great deal of variability between passages in terms of syntactic complexity', while Wang found that comprehension was actually facilitated by long sentences when they contained co-ordinate clauses (i.e. clauses joined by 'and' or 'but'). She stressed that 'it is not sentence length per se which makes a sentence difficult to comprehend'. Pearson and Camperell (1981) have also examined the role of linguistic connectives. They stated that:

> "When a connective is used in a sentence, it often has the effect of increasing the grammatical complexity of the sentence. Connectives are involved in the formation of compound sentences and subordinate clauses. Linguistic connectives usually establish or cue logical relations among propositions or sentences"

Pearson (1974) reported that fourth grade pupils preferred to have causal relationships stated in grammatically complex subordinated forms which included specific cues ("because", "so"). He speculated that the function of connectives is to make the causal relationship more explicit and suggested that connectives may serve to facilitate the integration of ideas in memory.

An alternative view was put forward by Gardner (1977) who tested secondary pupils' understanding of connective words used in scientific writing (such as 'similarly' and 'that is'). Gardner suggested that a passage which a writer has constructed with such care becomes, to the unskilled reader, just a collection of more or less random sentences. Perera (1979) also made the point that sometimes the connective words connect with an idea so far away in the text that readers have to hold a great deal in their heads if they are to understand the link that is being made.

Morris and Stewart-Dore (1984) cited Pearson and Camperell (1981) who suggested that the technique of cutting longer sentences into two or more shorter sentences usually removes the connectives which give the cohesion to text and which draw attention to the relationships which exist within it. They stated that text fragmented in this way imposes a heavy inferential burden on the reader who has to mentally replace all the deleted connectives in an attempt to re-establish meaningful reasoned relationships.

Kintsch et al. (1975) made a similar point by showing that texts which contain many concepts very densely compressed into short passages are harder to understand and are not as well recalled as those which repeat a few concepts several times.

d) Research into reading at the whole discourse level.

i) The structure of text

Pearson and Camperell (1981) described research into sentence structure as work on the micro-structure of text, differentiating it from work on structure at the whole discourse level which they termed 'macro-structure'. A number of workers have developed methods of analysing the internal structures of stories including Rumelhart (1975), Stein and Glenn (1977), Thorndyke (1977) and Mandler and Johnson (1979),

The importance of understanding the logical structure of text has been stressed by Baker and Stein (1981) who concluded that comprehension of logical structure is an early developed skill and that children's knowledge about logical relationships and structure greatly influences their memory for prose material. Those passages that are organized according to an underlying logical structure are better remembered than arbitrarily sequenced or disorganized passages. Baker and Stein have pointed out that most of the research into text structure has been undertaken in relation to stories rather than to expository text. They have suggested that this is because of the relative stability of the organizational patterns and logical relations which exist in most stories, although they admitted that it is easier for researchers to maintain children's interest in the task when stories are used. Estes (1982) made a similar point by observing that 'the grammar of narration seems to correspond to rules of thought and action familiar to most children by school age'.

Pearson and Camperell (1981) commented that research and theory about the macrostructure of expository text is much scarcer than for narrative text. They cited attempts by Kintsch (1974), Frederikson (1975) and Meyer (1975) to develop general schemes for representing the structural relations of expository text and showed that, although all the schemes differed in major respects, they shared an interest in the hierarchical aspects of text structure. Ideas in the text were scaled according to their structural importance within the hierarchy. For expository text, Pearson and Camperell suggested that 'important' be translated roughly into how 'main' the idea is.

Kucera (1980) analysed differences among types of text and found that informative prose has longer sentences and more complex syntactic structures than imaginative prose. Taylor (1982) has also explained the major differences between the structure of narrative and expository text:

> "Expository texts used in schools are frequently organized according to a hierarchical pattern of main ideas and supporting details. In general, this hierarchical pattern of superordinate and subordinate information is text specific. That is, most expository selections found in content text books are not organized according to a well defined conventional structure. Narrative texts, on the other hand, are usually organized according to a sequential pattern of events that follows the conventions of a story grammar." (p. 335)

Danner (1976) has shown that primary age children are aware of textual structure in expository text and that the amount of text recalled is greater from 'organized' than from 'unorganized' passages containing the same information. He found that only the older children in his sample (eleven year olds) could actually state that one passage was 'mixed up' and the other in the 'correct order'.

The importance of awareness of textual structure lies at the centre of Kintsch and Van Dijk's (1978) model of text comprehension. They considered that a reader cannot remember everything in a text and must therefore form a 'macrostructure' or 'gist' of the important ideas in the text to remember text content and then use it as an aid to recall more detailed information. Kintsch (1982) pointed out that structure alone is not enough and that it must not be confounded with content knowledge. This distinction could offer some explanation of the results of Meyer et al. (1980) who found that students designated as good readers organized their recall in the same manner as the authors of the passage, whilst those designated as poorer readers did not. Taylor (1980) also found that readers who followed the text structures in their written recall were able to remember more than readers who did not. Both these studies showed that younger subjects demonstrated less sensitivity to structure than older subjects.

The importance of structure in a text has also been emphasized by Tierney (1982) who cited work by Tierney and Raphael (1981) which showed that pupils frequently floundered when confronted with text in which there was some inconsistency, especially with passages dealing with unfamiliar topics. Krulee et al. (1979) have shown that if the references between one sentence and another are disturbed, readers have great difficulty in reconstructing the cohesion of the passage.

Estes (1982) cited Calfee and Curley (1984, unpublished at that time) who pointed out that most work to date on the issue of text structure and comprehension has been limited to the understanding of brief, simple narrative and exposition. He suggested that it would be more profitable to study how well existing text is structured rather than investigate the nature of text structure per se and cited Anderson, Armbruster and Kantor (1980) who examined the structure of samples of expository prose from text books from various subject areas and at various grade levels. They concluded that text books tend to be organized around misleading titles and subtitles, that they obscure their main ideas, omit crucial information, lack coherence, contain contradictory information and are logically inconsistent and ambiguous. Estes concluded that when students do understand their text books, it is in spite of the structure of what they are reading and that many text books are not particularly well structured to facilitate the reader-text interaction necessary for comprehension.

Wetmore (1980) described characteristics of a sample text book and reported results of a study to see how it might be improved. She restructured the text, keeping the gist of each idea and the order of the meaning units unchanged. The result of the rewriting was an increase in the total number of ideas recalled, in the number of important ideas recalled and in the correlation between the importance of an idea and the likelihood of its recall.

A similar study was made by Reder and Anderson (1980) who constructed summaries of passages to convey the main points and eliminate peripheral detail. They found that summaries produced better understanding than the passage in its original form.

ii) Adjunct aids to comprehension: advance organizers

The notion of advance organizers was first propounded by Ausubel (1960). Ausubel's theory of meaningful verbal learning predicts that learning text material can be facilitated by ensuring that students have an existing cognitive structure of the to-be-learned material before they actually begin to process it. Anderson (1980) explained this further by stating that advance organizers serve the function of building a cognitive structure or scaffolding. Reading the instructional material adds lower ordered information to the scaffold. Barnes and Clawson (1975) found that of 32 studies which attempted to establish the effectiveness of advance organizers only 12 studies reported that advance organizers facilitated learning. These reviewers concluded that even when length of study, ability level of subjects, grade level of subjects, type of organizer and cognitive level of the learning task were considered, no clear pattern of effects emerged.

Mayer (1981) described the role of advance organizers in learning as a 'major research battleground'. He suggested that studies since 1975, in which the advance organizers involved concrete specific models rather than the abstract principles suggested by Ausubel, have shown that pre-exposure to the concrete analogies significantly facilitated learning and memory of the reading material. Mayer (1979) reviewed some fifty studies and concluded that advance organizers tend to have their strongest effects firstly, when the material is unfamiliar or when the learners are novices so that they do not already possess their own model and secondly, when the dependent measure is creative problem solving.

Karahalios, Tonjes and Towner (1979) further defined an advance organizer as a written aid to supplement, in an explanatory manner, the reading and studying of the text. In a study with 76 seventh grade pupils, they showed that pupils who read science materials after being given an advance organizer explaining the major concepts using a simplified vocabulary, performed much better on a comprehension test than pupils who were merely supplied with the textual materials.

Barron (1978) has reported on a variety of advanced organizer which he calls 'structured overview'. This technique involves the construction of a list of key words arranged to show the development of the topic and the relationships which exist amongst the ideas.

Anderson (1980) concluded that since it is difficult to pin down an operational definition of an advance organizer, it seems unlikely that writers of prose will ever have enough guidance to make advance organizers an integral part of texts. It does appears that what Smith (1975) calls prior organizers and Burmeister (1978) Robinson (1975), Shepard(1973) and others call pre-reading experiences, can have a major effect on comprehension of texts.

iii) Adjunct aids to comprehension: inserted questions

Frase (1968), Anderson and Biddle (1975) and Mayer (1977) have found from the literature that, in general, inserted questions have a facilitative effect on learning from prose. Anderson and Biddle (1975) found that questions placed prior to the text consistently led to increased performance of the same or closely related questions but often to decreased performance on other questions. Anderson (1980) pointed out that the closer the questions were to the information about which they ask, the better the performance when those questions were repeated later. Hunkins (1970) studied the effects of analysis and evaluation questions on 6th grade social studies students. She concluded that only the better readers were aided by exposure to higher level questions. Similarly, Watts and Anderson (1971) studied the effect of question types on 300 high school students. They concluded that questions which required more processing improved understanding of concepts. Shavelson _et al._ (1974), on the other hand, found that whether questions were 'higher order' or 'lower order' made no difference to understanding. Bull and Dizney (1973) found that questions specifically designed to arouse curiosity may have a particularly facilitative effect. This would appear to be in opposition to the findings of Felker and Dapra (1975) with adults that questions worded similarly to the text produced greater recall than questions in paraphrased language, although Swenson and Kulhavy (1974) failed to find a similar effect in children.

Rothkopf (1982) described results of some of his earlier work in which it was found that subjects learned more from a 90-page earth science text if a 'teacher-like' figure asked them questions while reading than when they attempted to answer written questions embedded in the text. He suggested that this was not only due to the human contact but also to the psychological importance of the question being enhanced, thus encouraging learning.

Rothkopf (1982) also suggested that the use of adjunct questions is particularly appropriate when the teacher cannot describe goals in specific language. This is probably the case for many school subjects that deal with topics not as well structured as those of the natural sciences or mathematics. In these circumstances, the questions can convey to the reader the teacher's understanding of what is central and what is peripheral.

iv) Adjunct aids to comprehension: signposting

Jackson (1980) examined parallel chapters in six American history text books in order to determine whether the signposts in the books were sufficient to enable pupils to 'scan' as recommended in Robinson's (1962) 'SQ3R' strategy and many other strategies for study reading. She warned that in some cases there may be diminishing returns for such aids to interpreting the structure of the text. One of her sample of books had 81 different signposts in one chapter. Hartley et al.(1980) investigated the effectiveness of some of these signs with a sample of 200 English school children. The researchers claimed that their results were clearcut: that the use of subheadings had a marked effect on recall, especially for lower ability pupils. When the subheadings were in the form of questions, the recall of lower ability pupils was improved even more. These researchers cited work by Rickards and Hatcher (1978) which showed that the performance of poor comprehenders could be improved by placing questions after paragraphs in the text, but that the effects were not so marked for able readers.

Hershberger and Terry (1965) also showed that the use of multiple typographic cues is confusing for less able pupils.

B. The interaction between text and reader

a) Pupils' abilities to draw inferences from text

Baker and Stein (1981) cited Bartlett's (1932) statement that comprehension involves an interaction between the incoming information and what a person already knows. As a result, what is recalled will be a mixture of the information received from the text and information inferred by the reader. This hypothesis received support in an adult study by Bransford, Barclay and Franks (1972) and in a developmental study by Paris and Carter (1973). These and other studies cited by Baker and Stein demonstrated the ability of even the youngest children to draw inferences from text by calling upon their general knowledge of the world to supplement explicit information. Baker and Stein commented that most studies have investigated the existence of inference rather than the nature of the material which is inferred and suggested that for practical purposes children should not be encouraged to make every possible inference but only those which are necessary for comprehension. Johnston and Pearson (1982) have pointed out in this context that:

> "writers always omit from their presentation precisely that information they think readers will be able to fill in (i.e. infer) on their own. Serious mismatches in comprehension can occur when the information the author assumes the reader will fill in is not the same as that which the reader possesses (or assumes the author wanted filled in)". (p. 128)

Pearson (1981) cited Neilson (1977) who demonstrated that ten year old pupils can draw causal inferences between textually adjacent propositions and Gordon, Hansen and Pearson (1978) who showed that seven year old pupils can recognize causal linkages without direct cueing (terms like 'because' and 'since') although performance was enhanced dramatically when relations were made explicit by including cues, especially for pupils with limited prior knowledge of the topic. This finding supports those of Pearson and Camperell (1981) (described in the section on reading research at the sentence level) in that it would appear that *pupils need help with text structure especially* when they are on the periphery of their prior knowledge of the topic.

b) Pupil's abilities to determine main ideas from text

Baker and Stein (1981) described the skill of identifying 'main ideas' in a text as being an important component of comprehension. They cited work by Brown and Smiley (1977) with primary school children and Johnson (1970) with college students in support of their contention that more of the important information in a passage is recalled than the unimportant. They emphasized that there is no evidence in these studies to indicate that young children can deliberately identify the main ideas in a text. Brown and Smiley found that children showed differential recall of items but were unable to classify items into levels of importance. Brown and Smiley suggested that this is a problem of 'metacognition' - whereby young readers appear to have limited knowledge about their own cognitive processes. This would seem to be an allied concept to that of 'metacomprehension' as used by Baker and Brown and referred to below in this section. Brown and Smiley also cited work by Stein and Glenn (1978) which suggested that childrens' ideas of what is "most important" may change with increasing maturity.

Johnston and Pearson (1982) have suggested that sometimes reader purpose is at odds with writer purpose. They commented that in this case the reader must know how to override the structure of the text and to impose his own structure. Pichert (1979) found that when readers read a text about a house with the intent of finding out what a prospective homebuyer needs to know, they learn and remember different text information than if they are reading to learn how best to burgle the place. Wilson (1982) also showed that readers whose aim is to answer multiple choice questions read with different strategies from those with the intention of writing an essay.

A number of researchers, including Markman, 1979, have shown that young readers do not seem to notice inconsistencies even when they are capable of doing so, and similar effects have been noted for poorer readers. Langer (1982) cited Baker and Brown (in press at that date) who distinguished between metacomprehension (keeping track of comprehending) and studying (identifying important ideas). She suggested that the implications of the distinction were that young or poor readers, who lack metacomprehension, were less likely to seek clarification of poorly understood material.

c) The role of learning goals or instructional objectives

Rothkopf and his associates have investigated the effects of specifying 'instructional objectives' on learning from expository text.Rothkopf (1982) suggested that this may have been confused with 'behavioural objectives' by some reviewers of his work. The purpose of instructional goals is to identify for readers text elements which are particularly important for their purposes. Their effectiveness has been demonstrated by studies by Rothkopf and Kaplan (1972) which found that the availability of goal descriptions markedly increased the recall of goal-relevant information, an effect even more marked when the goal statement made use of relevant lexical features of the text. This conclusion was confirmed by Coke (1976) who found that searching text for synonyms is slower than verbatim search. Kaplan and Rothkopf (1974) and Kaplan (1974, 1976) found that increasing the number of learning goals reduced the effectiveness of the strategy, while both of these studies showed that learning goals increased the recall of incidental information. Later studies cited by Rothkopf (1982) showed that when there was no overlap between the lexical and semantic features of the text and learning goals, incidental learning is suppressed.

Gagné and Rothkopf (1975) and Rothkopf and Koether (1978) investigated the relationship between learning goals and the organization of information in the text. They found that learning was greatest in those cases where all the information required to meet a particular goal was presented in the same area of text and that failure to find information in the text relevant to some of the goals tended to weaken the search for other needed information.

Duell (1974) and Rothkopf and Billington (1975) also found that the recall of those information elements which readers ordinarily judge to be of low importance is particularly aided by descriptions of learning goals.

More recently, Duchastel (1979) has confirmed the selective attention hypothesis whereby objectives enhance learning of relevant information and has also confirmed that objectives increased recall only when their corresponding target paragraph appeared low in the structure of the text.

She concluded that: 'objectives and text structure can each provide the learner with orientation, but both together do not increase that orientation effect further.' (p. 106)

d) The role of pupils' background information

On the importance of background information in content area reading, Langer (1982) stated that 'researchers now know empirically what teachers have suspected.' She cited studies in support of her contention that background information affects:

i) the manner in which readers organize information in memory;
ii) what text-related information will be brought to mind in reading about a particular topic;
iii) what associations readers will make based on personal experiences and background knowledge;
iv) what language or vocabulary they will marshall based on their perspectives of the reading tasks.

Crafton (1983) investigated the effects of prior knowledge gained from text on the reading comprehension of 11th grade students. Crafton suggested that the study supports the view of reading as a knowledge-generating activity in which readers incorporate information into developing schemata. She commented that teachers often abandon reading as a source of background information and suggested that one text on an unfamiliar topic can serve as cognitive and linguistic preparation for the next.

Gagné _et al._ (1984) found that if students have trouble understanding new information because of a lack of prior knowledge, they will also have trouble remembering it later on. They also suggested that teaching methods which stimulate an enriched encoding of text book information should have long term benefits in recall.

e) The contribution of schema theory

Morris and Stuart-Dore (1984) suggested that schema theory is at the heart of current interpretations of the reading process, while Estes (1982) suggested that "it has limitless applications for how the 'structure' of an individual's knowledge might interact with the 'structure' of a text to result in understanding". Smith, Carey and Harste (1982) have explained a schema as:

> "a pattern of knowledge formed from experience that enables an individual to make sense of what he or she perceives." (p. 24)

Baker and Stein (1981) and Estes (1982) concluded that for most people a 'story schema' is developed early. Estes pointed out that the schemata of young readers may be insufficient to provide the necessary direction for reading expository text. Morris and Stewart-Dore (1984) suggested that since narrative forms are more frequently encountered, our schemata for narratives are far richer than those for expository material. Smith, Carey and Harste (1982) commented that teachers and textbooks are schema rich in areas where students are schema poor. Nicholson (1984) confirmed this in his observation study of high school classrooms in New Zealand which revealed a mismatch between the 'everyday' knowledge of the pupils and the 'expert' knowledge of their teachers.

Schallert (1982) emphasized that:

> 'Schema theory is first and foremost a theory of the form and content of the internal representation of knowledge and how that knowledge is implicated in comprehending the world. As a theory of the change and growth of knowledge, it has not been fully developed. .....Schema theory has not offered much by way of describing how people learn from informative text.' (p. 40 - 41)

She considered that the main reason why schema based research has not aided our understanding of how people learn from informative text is that most studies have ignored the main purpose of informative text, which is to inform the reader and to cause a change in schemata and ways of looking at reality. Pearson (1981) also warned that "while it is one thing to demonstrate that existing schemata, developed naturally over time and/or invoked for a particular selection, facilitate comprehension; it is quite another to demonstrate that specific teacher-directed activities designed to alter readers' schemata for a particular topic will have a similar effect".

C. Studies of the readability of text

Studies of the readability of text may be grouped in three ways.

a) the legibility of written text;

b) the inherent complexity of the words and sentences which make up the text;

c) the complexity of the written text in relation to the reading ability of the reader.

a) Legibility of written text

Jaspert et al. (1970) listed over 2,350 different typefaces while Zachrisson (1965) listed 19 typefaces which are in common use in Western Europe. Although the research into typography has been reviewed extensively (Pyke, 1926; Paterson and Tinker, 1940; Luckiesh and Moss, 1942; Burt, 1959 and Tinker, 1963), Macdonald-Ross and Waller (1975) have commented that little guidance has been forthcoming on what to do with the results. They suggested that this is proper caution since Vernon (1931) showed that confusion of individual letters is of negligible importance in the reading process. Hartley, Burnhill and Frazer (1973) have shown that type-size, interline spacing and line length have little effect on the reading of 10 - 11 year old children with widely differing reading abilities. To this should be added the findings of Poulton and Gregory (1970) that unjustified, 'ranged left', settings are more legible for text printed in short lines and for less able readers.

Burnhill and Hartley (1975) reviewed the research on text book design to that date and emphasized the importance of considering the whole layout of printed materials rather than the component parts. Hartley (1978) has summarized the research related to the various components of instructional text design for the benefit of writers and designers.

Foster and Coles (1977) found that the use of **bold** and CAPITAL cueing improved polytechnic students' recall of the cued information, although at some cost to incidental information but acknowledged that in some cases a complex cueing system may actually impair study. Hershberger and Terry (1965) tested a complex cueing system with schoolchildren and found no improvement, while a simpler system which provided visual distinction between 'core' and 'enrichment' content yielded significant improvement. Lidstone

(1977) found that younger pupils of secondary age frequently failed to perceive typographic cueing in a text book with which they were familiar.

Wendt (1979) investigated the effects of varying the layout of physics text books on the secondary school pupils' reading speed and recall. He found no significant differences with single or double column layout, nor with increased interword spacing. 'Visualized version' of the text in which basic information, descriptions of experiments, auxiliary information and figures were placed in separate columns, resulted in both increased reading speed and increased recall. This design had fewer words than the other versions but more graphic illustration and use of colour.

Macdonald-Ross (1977a) commented on the large number of single factor experiments which have been carried out, many of which have found little difference between alternative typographic conventions. He cited Tinker's (1963) work on the cumulative effect of suboptimal arrangements, and his ideas about the 'hygienic reading situation':

> "Imagine a text full of conceptual muddle, unclear expression, visual confusion, and suboptimal setting being read by someone who is tired and disinterested, sitting in poor light, with the text not at right angles to the line of sight, and in a noisy room full of interruptions and distractions. This gives you some idea of a real-life reading situation". (p. 77)

The last major review of the legibility of children's books in the United Kingdom was that of Watts and Nisbet (1974) in which the reviewers were able to report that there was little in the area of legibility to give cause for concern.

b) Measuring the readability of text

Dale and Chall (1948) have defined readability as follows:

> "In the broadest sense, readability is the sum total of all those elements within a given piece of printed material that affects the success which a group of readers have with it. The success is the extent to which they understand it, read it at optimum speed and find it interesting." (p. 84)

Hittleman (1978) has distinguished between techniques designed to predict the readability of a textual passage in order to place it on a continuum of passages whose 'readabilty scores' have already been established, and techniques which attempt to measure readability of a text passage in terms of the reader's understanding. Prediction of readability is frequently by means of formulae in which a number of linguistic factors found to correlate highly with reading difficulty are related, although Klare (1963) has found that the pooled judgements of teachers are also highly reliable. Measures of readability have been made using multiple choice comprehension tests and more recently by variants of what Taylor (1953) called 'cloze procedure'.

i) Measuring the readability of text by formulae

Klare (1963, 1974) and Gilliland (1972) have reviewed the development of predictive readability formulae and shown that most formulae have been created from analyses of the linguistic variables which add to the difficulty of a passage as judged by the results of comprehension tests. Carroll (1972) and Anderson (1972) have reviewed research which has cast doubts on the validity of comprehension tests, while Tuinman (1973-4) has demonstrated their weaknesses in a novel manner. Despite these doubts, Harrison (1980) has pointed out that most of the readability formulae in use were initially validated by correlation with comprehension tests. More recently, formulae have been correlated against one another and against pooled teacher judgements of text difficulty.

The majority of formulae in common usage are based on one or more of three variables: word familiarity, average word length and average sentence length. Nelson (1978) made the point that the words that are most likely to cause a high readability score for a content area text book are the technical vocabulary of that subject area. She suggested that it would be foolish to change or eliminate them when they represent the very substance of the subject the teachers are trying to teach. A number of writers, however, most recently Harrison (1979, 1980) and Rye (1982) have emphasized that these three features of text are not necessarily causes of difficulty, but correlate highly with difficulty. Similarly, Zipf (1935) demonstrated that word length is inversely correlated with word frequency.

The 'Effective Use of Reading Project' (Harrison 1979, 1980) undertook a detailed cross-validation study of ten formulae with teacher-pooled judgements of difficulty. It showed that the Dale-Chall formula correlated most highly, but commented on the complexity of its application. Of the other formulae, Harrison found that the Flesch Grade score was most appropriate for use with text at the secondary level and that scores derived from the Fry graph, which uses counts of word length and sentence length to give a reading grade, correlates highly with Flesch scores.

Both Klare (1975) and Harrison (1977) have warned that individual teacher's judgements are very unreliable as compared with pooled judgements.

Ames and Bradley (1981) analysed inter-book variability in readability in a social studies text book at the secondary school level. They found differences for individual chapters of up to three grade levels above and below the whole book mean.

ii) Measuring the interaction of reader and text: cloze procedure

Harrison (1979, 1980) also considered the cloze procedure, first developed by Taylor (1953). Rye (1982) described the rationale behind the cloze procedure. He related the processes of cloze test completion to those of fluent reading described as "a psycholinguistic guessing game" by Goodman (1967/1976). Goodman considered that fluent readers use a number of clues in language to construct hypotheses about what may be coming next in any language sequence. These hypotheses are then confirmed or modified as the eyes scan the ensuing context information. Rye (1982) suggested that in cloze procedures, the reader has to reason and construct suggestions to fill the gaps on the basis of the evidence derived from the context.

Cloze tests have been cross-validated with formulae scores by Bormuth

(1966) and Miller (1974). Both of these workers have found high correlations but Harrison (1979) and Schlief and Wood (1974) found lower correlations. Harrison suggested that these differences are due to the differences in the text samples chosen. Bormuth (1966) and Miller (1974) used carefully balanced groups of information-giving passages; Schlief and Wood (1974) used magazine and newspaper articles. 'The Effective Use of Reading Project' (Harrison, 1979) used the text passages which had been given to their pupil population during a given week. Harrison concluded that 'at the individual level, cloze answers give us some idea of how the reader is responding to the text, and equally the pooled scores of large numbers of children on cloze tests have been found to correlate highly with other estimates of passage difficulty in many studies' (p. 97).

Bormuth (1965b and 1968b), Spooncer (1974) and Mobley (1980) have compared exact word replacement in cloze tests with synonym replacement and found that the correlations between tests marked in both these ways are high. Mobley suggested that exact word scoring is most appropriate for scientific and precise subject matter, whereas synonym scoring is more appropriate for fiction.

Oshima (1980) cross validated each of three variants of cloze precedure with comprehension tests and standardized tests of reading skills, using social science text books. She found that all three measures were reliable and valid measures of readability but that the standard cloze procedure seemed to be both the most effective and efficient.

c) Studies of the readability of school text books

Harrison (1979) found that science and social studies for first to fourth year secondary pupils contained the most difficult texts. These results are consistent with those reported by Klare (1963) in which science and social science texts were rated as too difficult for most of the pupils who are required to read them. Harrison pointed out that the difficulty level of a book is not the only determinant of how successfully it can be approached by readers, and distinguished between a book being used as a source in class and as unsupported reading. He also reported that texts set by teachers to be read by children on their own are more difficult than those used in class. Harrison related this finding to the results of his work with

Dolan and Gardner (1979) based on observation studies which found that the need felt by teachers to deal with practical work and give notes did not allow time for reading in class. The use of the text book for reading, reference or note making was often relegated to homework. Gould (1977) found that in science lessons the text book was most often used for the examination of illustrations or for seeking information with the teacher's assistance.

Pirozzo (1982) investigated the reading levels of a history text in use with Grade 9 Australian pupils. Pirozzo rewrote the passage at Grade 8 level and found that the number of pupils able to read it unaided increased.

Gillard (1975), Gould (1977), Johnson (1979) and Graham (1981), also investigated the readability of text books used in science teaching. They found that the text books studied had higher readability levels than the ages of the pupils by whom they were being used. Cloze tests confirmed that many pupils were reading at the frustration level.

d) The role of teachers in research experiments on reading behaviour

Light and Pillemer (1982) pointed out that there are important contextual variables in educational research that can influence the effect of innovative teaching strategies. Dolan (1978) compared various types and combinations of advance organizers, instructions for reading and interspersed questions, in conjunction with passages from a social studies text book. He found that, regardless of the stategy adopted, the scores of all his groups increased before declining at a consistent rate as the period of the study continued. Dolan attributed this to a "fatigue factor" and suggested that while such comprehension aids might have a positive short-term effect, over a longer period they could be detrimental.

Similar results were found by Wilkens (1977) who used a procedure to test comprehension aids in which materials were given to pupils in personal folders. Wade (1983) commented that what pupils seem to have enjoyed was the personal attention represented by the folder, but that this apparently became less motivating once the novelty wore off.

Estes (1970) and Hash (1974) investigated the effects of a number of comprehension aids and found no significant differences. Estes suggested that the teachers may have been exerting a greater influence on the results than the experimental materials, while Hash noted that teachers were not always willing to construct and use the comprehension aids, or to do so in ways suggested by the experimenter.

Wade (1983) commented on the success of a number of studies in which teachers were involved in the planning and implementation. Their success was attributed to the teachers' experience which ensured that the teaching strategies were based on methods that had been found to work and which could be adjusted and refined to meet the needs of pupils involved in the study. Wade also suggested that successful teaching strategies were those which involved high teacher-pupil interaction, and were, therefore, dependent on teachers' abilities to teach. She contrasted these studies with those which attempted to single out particular instructional strategies or materials to test their efficiency in controlled experiments. Many such experiments relied heavily on materials and exercises that students used either independently or in small groups without much direct involvement from the teacher. Wade suggested that students frequently found the strategies to be repetitive, boring and unhelpful, while teachers were in some instances reluctant to implement them.

D. Summary of the research on learning from text in the context of text books

In this section research is described which relates firstly, to the structure of text and secondly, to the relationship between the text and reader. Comment is also made about the role of the teacher in the interaction between pupils and their text books.

Some researchers have suggested that vocabulary is learned from the context in which it is encountered. Other researchers have pointed out that while this may be true of unknown words encountered in narrative text, an understanding of technical vocabulary may be an essential precondition for effective reading of expository text. Long sentences, especially those which include connectives not fully understood by the reader, may make reading more difficult. The removal of connectives in order to reduce sentence length may also reduce the cohesion of the text by failing to draw attention to the relationships which exist within it.

Much research has shown the importance of a knowledge of textual structure although most of these studies have been based on narrative text. In studies of expository text, researchers have shown that the amount of information recalled is greatest when the recall has to be presented in a form similar to that of the original text.

There has been much debate on the role of advance organizers, much of which has centred on their definition. There seems to be evidence that some method of clarifying the structure of expository text helps novice learners who do not possess their own model of the text structure and when the reason for reading is to develop skills in creative problem solving.

Similarly, questions inserted in the text have been shown to improve learning, although the improvement is usually only in the area of the content tested. Questions can indicate to pupils which aspects of the text are regarded by the teacher as being most important and which are of peripheral importance.

Sub-headings used in moderation have also been shown by researchers to improve learning, although the use of multiple typographic cues may be confusing for less able pupils.

A number of researchers have shown that even very young children can draw inferences from what they read. Misinterpretations occur when readers do not possess sufficient prior knowledge to draw appropriate inferences from a passage. Similarly, it has been shown that young readers differ in their abilities to discern the main ideas in a passage and this may cause particular problems where the information required by the readers is at odds with the main ideas of the passage as intended by the writer. It has also been suggested that young and poor readers may be unaware of inconsistencies and are less likely to seek clarification of poorly understood materials. Such findings suggest that clearly stated learning goals would improve learning from expository text and this suggestion has been confirmed in a number of studies. It has also been found that pupils' prior information on a topic is of major importance in their understanding of written text.

Many of the ideas on the comprehension of expository text have been subsumed under the concept of schemata. Emphasis has been placed by a number of writers on the importance of pupils possessing appropriate schemata for their various reading tasks. There has been little work on the effectiveness of teacher directed activities designed to create or alter readers' schemata for particular topics.

There have been a number of studies on the influence of typography and layout but there seems to be no evidence that current standards of text book printing are a cause of reading problems for pupils.

A considerable amount of work has been done on the readability of text. Readability formulae have been shown to have predictive validity but do not help in finding reasons for reading difficulties nor in the writing of text. While formulae may predict the suitability of text at the grade level only cloze procedure tests the relationship between text and specific readers. When tests of readability have been applied, geography and other social science text books have often been found to be too difficult for the pupils to whom they were presented.

This review of research on learning from text has revealed that there are a number of different levels of reader-text interaction. Through them all appears to be a common thread - the observation that the interaction between the reader and the text is conditioned, firstly, by the reader's prior knowledge of the topic, whether this be at the level of vocabulary knowledge or schemata pertaining to the subject area and secondly, by the reader's goals.

In considering the relevance of the research on written text to the use of text books in geography classrooms, the warnings of Peters (1982) are particularly pertinent. Firstly, Peters pointed out the differences between research with self-selected subjects in a laboratory and research with student subjects in an instructional setting. Secondly, he stated that much of the research implied a text-reader interactive model whereas it might be more appropriate to adopt a text-reader-teacher interactive model "Because it is the teacher who augments the learning process by providing the student with the necessary focus and structure". No studies could be found which have adopted such a text-reader-teacher interactive model.

2. THE USE OF ILLUSTRATIONS IN TEXTBOOKS

A. The role of illustrations

a) Introduction

Fleming (1962) noted that pictures are not highly esteemed in our society and justified his statement by pointing to the existence of the words 'illiterate' and 'inarticulate' and to a lack of words such as 'impictorial' or 'iniconic'. In this he seemed to be making a similar plea to that of Balchin (1970) who claimed a place for 'graphicacy' in addition to the three 'aces' of literacy, articulacy and numeracy. In support of the role of pictures in stimulating significant intellectual endeavour, Fleming cited Hogben's account of the contributions of the great artists to advances in medical knowledge through their pictures of the details of human anatomy.

Levie and Dickie (1973) have shown that although the term 'media' is widely used to refer to the variety of methods used to carry the message of communication, very few definitions of the term have been provided and hence no adequate taxonomy has been presented. Dale (1969) proposed a hierarchy of media based on the notion that certain forms are inherently more difficult to learn from, or are more abstract, than others. Sless (1981) has pointed out that such a classification of media, independent of author or audience cannot be logically sustained.

Bruner & Olson (1973) proposed a classification of learning into three kinds deriving from three modes of experience: direct action, models and symbolic systems. Referring to the symbolic systems of learning they wrote:

> "These media make strong assumptions about the literacy of the learner. The properties of a 'good' explanation, description or portrayal are complex subjects worthy of study in their own right. But to untangle the educational effects of these symbolic systems we again have to differentiate the knowledge of the world conveyed through the system from the skills involved in the mastery of the structure of the medium itself." (p. 225)

Similarly, Salomon (1974) noted that media can be represented as consisting of messages (subject matter content), technologies of transmission (the tools used) and symbolic systems (pictorial cues and the mental imagery these cues evoke and the mental operations required to make the translation from the pictorial cues to the mental representation). Sless has stated that this suggests a conflation of author/message and audience/ message. Nevertheless, Salomon (1979) suggested that the most important attributes of the various media in terms of learning and cognition are their ways of structuring and presenting information, that is, their symbol systems.

Salomon (1979) studied the interaction of media cognition and learning, starting with the assumption that 'media's ways of structuring and presenting information - that is, their symbol systems - are media's most important attributes when learning and cognition are considered'. Sless interpreted Salomon's contribution to learning as pertaining to the 'hidden curriculum' of Snyder (1973) and suggested that if, as Salomon's experiments (1974) appeared to show, children's cognitive skills are influenced in their development by particular media conventions, then it is time to ask how much of this learning should be allowed to remain outside direct influence.

b) The relationship between pictures and cognition

Kennedy (1974) and Sless (1981) examined the evidence relating to whether perception of pictures is learned or innate, and reached different conclusions. Kennedy placed great faith in the results of an experiment by Hochberg and Brooks (1962) in which they tried to bring up their child in a picture-free environment and then to determine whether the child could identify everyday objects from their pictorial representation. Sless dismissed this experiment on methodological and philosophical grounds (although forebore to comment on the ethics of the experiment). He suggested that anything which is distinguishable from an object can be used to stand for that object and that this accounts for the child's behaviour. Sless was able to explain the results of a number of other studies by reference to this 'stand-for' hypothesis and concluded that the perception of pictures is learned. He explained that this learning consists of acquiring the concept of pictures which enables an application of the 'stand-for' rule. Since many studies show a less than 100% correct identification of objects from their depiction, Sless further suggested that while it is possible to describe the logical connection between a picture and what it represents by studying the author/message relationship, the audience is not privy to this logical connection, but only to the picture. Thus, errors may be due to the audience searching the picture using an inappropriate kind of logical relation. This led Siess to comment of the sterility of much of the debate about whether pictures work by being somehow like the objects they depict, or whether they work by a system of arbitrary conventions like language.

c) Types of graphic illustration

Morris (1946) was among the first to distinguish between what he called iconic signs, represented by pictures and images, and non-iconic signs (or digital signs), represented by words and other symbols. Knowlton (1966) has pointed out that while words (digital signs) have no inherent interest, pictures, as vehicles, are typically interesting. He also claimed that an important function of pictures in communication is to gain attention, arouse interest or please aesthetically, but that while they thus serve both referential and emotive (or non-referential) functions, such functions are both logically and psychologically distinct. He also drew a distinction between the physical attributes of the vehicles involved and the meanings of visual-iconic signs.

Knowlton noted that a visual-iconic representation can be thought of as having three 'parts': the elements, their pattern of arrangement and their order of connection. He suggested that a visual representation may be regarded as iconic if at least one of its 'parts' is non-arbitrary. Furthermore, each of the three parts can represent 'reality' in any one of three ways: realistically, by analogy or arbitrarily (conventionally). Knowlton has assembled these aspects into a matrix of potential types of visual-iconic representations (Figure 7).

In Knowlton's terms, 'realistic pictures' are those which are pictures in the vernacular sense. He stressed that not all such pictures may be included in this category since the meaning attributed to the pictures may differ. He cited the example of a photograph of a clothing worker using a template to cut cloth being used to demonstrate the role of DNA in determining genetic traits. In such a case, the role of the picture is that of 'analogical picture' since it is merely an analogy of a process which is impossible to portray realistically.

Knowlton also suggested that the real world is sometimes too complex and that therefore highly schematized pictures may be used. Such pictures are visual representations wherein the elements are arbitrarily portrayed while pattern and/or order of connection are isomorphic with the state of affairs represented. Thus Knowlton suggested that a logical picture has greater potential for signifying relationships or structure, while a realistic picture is of greatest worth in portraying scenes of inherent interest, aesthetic worth or dramatic impact.

In relating picture types to subject areas, Knowlton has suggested that in the formal sciences, one would need few realistic pictures, since much that needs to be portrayed is essentially unpicturable, but many logical pictures. In biology Knowlton would expect much use of realistic pictures.

	e p c	e p c	e p c
Realistic pictures	I-I-I	I-A-I	I-X-I
	I-I-A	I-A-A	I-X-A
	I-I-X	I-A-X	I-X-X
Analogical pictures	A-I-I	A-A-I	A-X-I
	A-I-A	A-A-A	A-X-A
	A-I-X	A-A-X	A-X-X
Logical pictures	X-I-I	X-A-I	X-X-I
	X-I-A	X-A-A	X-X-A
	X-I-X	X-A-X	X-X-X

* The 'parts' of representation are designated as follows:
e = elements; p = pattern; c = order of connection.
** The manner of representation is designated as follows:
I = Iconic; A = Analogic; X = arbitrary.

Fig. 7. The logically possible types of visual representation (after Knowlton, 1966)

In addition to his point that realistic pictures sometimes 'say too much' by providing the viewer with cues that are irrelevant to the purpose of the communication, Knowlton (1964) also differentiated between the capacities of digital and iconic signs to refer to concrete objects and abstract concepts. He suggested that a single picture of a complex object such as an elephant may do the work of many words, but it would take many pictures to communicate an abstract concept like 'mammal'. Knowlton summarized the differences between words and pictures by noting that iconic signs give knowledge of the world by providing sensory data whereas digital signs give knowledge about the world by providing conceptual information.

Kolers (1973) proposed that pictures are better than words at depicting spatial arrangements and, through certain conventions, some kinds of temporal relations. Graphs, Venn diagrams, architectural drawings, flow charts and maps are particularly effective in conveying spatial and temporal relationships between concepts. Schallert (1980) cited Ortony (1975) who considered that metaphor serves to express vividness, compactness and inexpressibility, and claimed that pictures can act in exactly these ways in helping readers to attain a full realization of the author's intent. She suggested that, used in this way, pictures may convey an intended meaning through the vehicle of concrete referents that are likely to encourage the reader's imagination.

Fleming (1977) cited work by Posner (1973), Nelson (1974), Rosch (1975) and Anderson and McGaw (1973) which appeared to show that concepts were frequently represented by images of concrete examples which had psychological significance as 'good' examples and which in a sense stood for, or 'represented', the concept. He suggested, for example, that the abstract nature of 'fruit' may be cognitively represented by an easily imaged 'good' example such as 'apple'. If this is true, then discussions about whether imagery can have cognitive status become irrelevant.

Levie and Dickie (1973) suggested that in comparing the relative merits of words and pictures, it is important to distinguish between words or pictures being used to teach a concept and cases in which words or pictures are being used to communicate a concept which has already been learned. Levie and Dickie have also investigated the distinction between digital and iconic signs in terms of the elements present in each and the ways in which these are combined to make statements. The distinction between digital and iconic signs was first drawn by Morris (1946). Morris explained that an iconic sign is one which resembles the thing it stands for. Photographs, drawings, sculpture and maps are iconic signs. A digital sign is arbitrary and does not resemble its referent in any way. Words, numbers, morse code and semaphore are examples. Levie and Dickie commented that the English language has a syntax that specifies how signs are related to make statements, but it makes little sense to talk about a grammar of pictures. They suggested that pictures seem to be limited to the verbal equivalent of statements such as 'it exists' or 'it looks like this'. The meanings 'is not', 'could be', 'should be', 'will be' and 'was' are not directly pictureable. Gropper (1963) has also noted that pictures are poor signs for communicating generalizations such as 'all', 'many' or 'most'.

Levie and Dickie also suggested that while digital signs frequently present elements sequentially, iconic signs present all their parts at the same time, allowing the perceiver greater control of the order in which the parts are 'taken in'. They suggested that where the order in which ideas are encountered is critical, digital signs may be preferred over some types of iconic signs, but where the learning task involves understanding large numbers of relationships, a map or schematic diagram which presents all the relationships simultaneously may help to overcome the limited capacity of human beings to retain a sequence of ideas. Bransford and Johnson (1972) demonstrated the importance for prose comprehension of a context defined by appropriate illustration by using a using a passage which apparently made no sense until an appropriate illustration was provided.

Schallert (1980) cited the work of Rohwer and Harris (1975), Rigney and Lutz (1976) and Royer and Cable (1976) as well as that of Bransford and Johnson (1972), in support of her contention that pictures, concrete examples and analogies share the capacity to assist the reader to an understanding of the way the concepts being learned are structurally related.

Levie (1978) suggested that the symbolic codes of pictorial media can be placed on a continuum from those which create perceptual images to the range of codes which have the status of pictorial conventions such as those used in cartoon-type drawings as well as the conventions of map drawing. Such codes include the use of disequilibrium to suggest motion in still pictures, depth cues through perspective and overlap and boundary line information to help in identifying figure and ground. Levie suggested that further research is needed to find ways in which the codes may be taught to improve picture understanding.

Levie and Lentz (1982) in their review of the research on the effects of text illustrations differentiated between 'representational pictures', including line drawings and photographs, and 'non-representational pictures', including maps, diagrams, charts and graphs. They also emphasized the relationship between the information contained in the text and the information contained in the illustrations. They pointed out that in any text book, some information is presented only in the text passage, some is contained only in the pictures, and some is 'illustrated text information'.

Magne and Parknas (1962) differentiated between the information value and motivation value of illustrations and suggested that care be taken in drawing conclusions about the effects of pictures on learning from experiments which use pictures of high motivation but low information value.

Duchastel (1978,1980) pointed out that there must be a clear purpose for including illustrations in text, and suggested that they may be considered as having attentional, explicative and/or retentional roles, although these are not considered as being mutually exclusive. Attentional illustrations are included in a text to interest and motivate the reader, and accordingly 'need only provoke the eye'. Explicative illustrations help explain a point being made in the prose or add something which is not clearly expressible in words. Retentional illustrations enhance long term recall of the prose by presenting the learner with an iconic structure of the subject matter which is being presented. Sless (1981) pointed out that most of the pictures encountered in our culture are of the 'attentional' variety, and that unless students receive guidance as to the use of pictures which they encounter, they will assume that all have an attentional role and will therefore treat them as only incidentally relevant to learning.

Duchastel and Waller (1979) defined 'descriptive' pictures as being 'to show what an object looks like' and thus they discriminated between these and expressive illustrations whose function is 'to make an impact on the reader beyond simple description'. Constructional illustrations include 'technical drawings' such as designers' drawings, maintenance drawings and technical illustrations whose role it is to show how artifacts work, while functional illustrations' "enable the learner to visually follow through the unfolding of a process or the organization of a system". Sless suggested that this type of illustration represents the boundary between visual processes and the activity of theory construction, and also represents the boundary between drawings and diagrams. Duchastel and Waller also differentiated between logico-mathematical diagrams such as line graphs designed to portray mathematical relationships, algorithmic diagrams which include research flow charts and other systems diagrams and the large category of data display devices which transform numerical information into a graphic form.

The debate outlined above on appropriate ways to classify the various graphic devices found in text books is made more difficult when an attempt is made to review the research studies undertaken by cognitive psychologists, media specialists and specialists in traditional school subject areas who have investigated the use of graphics in the text books of their subjects. In view of the need to ensure a close relationship between past research and the empirical study to come, and the particular problems involved with that study, it was decided to consider the graphic illustrations of text books under the broad headings suggested by Duchastel and Waller (1979):

i) studies relating to representational illustrations (photographs and drawings of high fidelity in Gibson's,1954, terms);

ii) studies relating to non-representational illustrations in which conceptual or temporal relationships are portrayed (scientific diagrams which explain and illustrate, systems diagrams, and flow charts);

iii) studies relating to non-representational illustrations of numerical relationships (graphs, charts and tables);

iv) studies relating to non-representational illustrations portraying spatial relationships (maps and aerial photographs).

B. Studies of representational illustrations: photographs and drawings

Travers and Alvarado (1970) suggested that very few still pictures such as are found in school text books are designed to show still scenes and stated that if viewers saw them as such, many would be valueless as instructional devices. These writers analysed a number of the conventions used by photographers and artists to create the dynamic properties of their pictures so that they can give their viewers the impression of something having happened, something happening and something going to happen.

a) The role of imagery

Rasco, Tennyson and Boutwell (1975) and Levin (1976) have cited a number of studies which have shown that subjects who were instructed to evoke images or to use a mnemonic when associating paired objects, regularly remembered more than those left to their own strategies. In their own study, Rasco et al. investigated the effects of directing primary and secondary school pupils to form mental images of both prose materials and relevant drawings on a task which required the processing of verbal information rather than direct recall. They found that drawings and the instruction to form mental images from the prose passage consistently resulted in superior performance in the tasks. However, as Schallert (1980) pointed out, the results of the study showed that there was little difference between the performance of those students who were told to imagine features of the text and those who were given pictures. Further, although both techniques produced equivalent and positive results, their effects were not additive. Such findings do not either support or deny the hypothesis that pictures induce imagery as an intermediate step in comprehension.

Levie and Lentz (1982) concluded that learning is increased when learners produce their own drawings based on text but only when the drawings are relevant to text content. They pointed out that young children may require much help in producing effective drawings and that since drawing takes time, learning may be limited when 'time on task' is controlled.

Fleming (1977) investigated the "picture in the mind" which he defined as a recalled image. He referred to the knowledge of ancient mnemonists and orators that picturing things together, is a powerful strategy for improving memory, and commented on the frequent replication of the phenomenon by researchers across different kinds of learning. Fleming acknowledged that little is known of the mechanisms and processes which lie behind such feats of memory and, citing work by Standing, Conezio and Haber (1970) which found that subjects shown 2,560 colour pictures for ten seconds each could then recognize them with about 90% accuracy, admitted that it is not even known whether mental imagery is implicated at all. Fleming suggested that the implications of this discussion for educational practice are that if concepts are cognitively represented by an abstraction, presumably verbal-like, then concept teaching should feature verbal definitions and lists of defining attributes. If on the other hand, concepts are cognitively represented as generic images then it would be more important to teach through the use of numerous instances, either pictures or objects.

b) Learning from pictures

A number of workers have studied the role of pictures in geographical education including Parker (1944),and Svec (1944, 1948). Dillon (1965), Griffin and Chatham (1967) and Brown (1969) are among the many who called for greater precision in teachers' use of pictures in geography classrooms. Scarfe (1949) in his review of the literature of geographical education was able to write "experiments have shown that it is no longer necessary to test the attitude of children towards the use of pictures in teaching geography, but there is a need for more enquiry into the best types of pictures to use, (and) the exact methods of using them in the classroom." One of the earliest research studies in this vein was that by Long (1953). She concluded that children need guidance in the selection of photographic detail for close study, and careful and constant training not only in the appreciation of size but in the perception of wholes. Long (1961) was able to add that while the secondary school children in her study were able to recognize specific physical features in a picture when invited to search for them, they were less likely to notice them in free observation. This phenomenon was not found for features of the human landscape. Lidstone (1977) found similar results. Long commented that what is observed may depend on two major factors: the familiarity of the child with the features and the location and emphasis of the feature within the picture itself. She considered that as much as one-fifth of geographical significance escapes the record of even the most observant sixteen year old, being either not seen, not recognized, not understood, not recorded or not regarded as worthy of comment. She affirmed that children of all ages are able to discover what is geographically significant in pictures if their search is guided.

c) The effect of pictures on learning from text

One of the first researchers to investigate the effects of illustrations on learning from text was Vernon (1950, 1952a & b, 1953a & b, 1954). Vernon explored the effects of illustrations on the learning of English school pupils of all abilities aged fifteen years and upwards. She concluded that an illustrated version of her material was remembered no better than an un-illustrated one, or than one accompanied by graphs. In several cases the pictures produced a considerable emotional impact, such as might affect the attitudes of the subjects to the social problems described in the text. Vernon could not conclude that these attitudes would lead to reasonable suggestions for courses of action because, she claimed, her subjects did not attempt to understand the problems, but accepted the more striking facts presented in an uncritical manner.

Klingberg (1957) replicated Vernon's studies and found that retention of texts with pictures is about the same as retention of unillustrated texts, and that pictures hinder pupils from giving the text their full attention.

Brody (1981) emphasized the importance of discriminating between research into the effects of illustrations on learning from reading and the effects of illustrations on learning to read. He pointed out that some reviewers have conflated these two aspects of picture research.

Samuels (1970) reviewed the literature on the effects of pictures on learning to read, comprehension and attitudes. He found that pictures may inhibit learning to read. Samuels cited a number of studies conducted between 1938 and 1969 which investigated the effects of pictures on comprehension of written text. He concluded that even if a picture does contain information relevant to a test, the students may have difficulty determining which part of the picture is relevant and which part is not.

Denburg (1976), on the other hand, in her summary of the literature, found considerable evidence that pictures can facilitate learning to read. She attributed the diversity of opinion among researchers to the varying definitions of 'reading' which had been applied. In her own research, she found that, rather than distracting children away from the written word, pictorial information may call forth whatever limited knowledge of letters and the sounds they represent that a child is able to contribute. This incomplete information of the meaning of words would otherwise remain unused. She concluded that by using pictures in this way, the beginner gains experience as a 'skilled' reader, integrating information from different sources.

Willows (1978) also investigated the effects of pictures on the word recognition of young children and found that the children consistently read more slowly when pictures were present, that pictures unrelated to the text produced more interference than related pictures and that the magnitude of both effects was inversely related to reading ability.

Magne and Parknas (1962) proposed that it is indefensible to measure the retention of pictures only by verbal tests. They showed that the method of testing does affect the definition of retention and they concluded that if pictorial retention is required, instruction should be through pictures, while if verbal retention is required, verbal materials should be employed.

Watts (1965) studied the effects of different modes of data presentation on the ability of eleven year olds to learn geographic terms. She found that three dimensional models and diagrammatic drawings were superior to filmstrips, photographs and verbal definitions.

Dwyer reported some thirty-two separate studies between 1967 and 1972 and summarized them (Dwyer, 1972) all of which were based on cross sectional pictures of the human heart and included simple line drawings, detailed shaded drawings, photographs of a heart model and photographs of an actual heart in both monochrome and colour. Dwyer (1972) found that the effectiveness of visuals as instructional cues and reinforcers depended on:

i) the nature of the educational objectives;
ii) the method of presenting visuals;
iii) class organization;
iv) type of cues associated with the visual;
v) the prior knowledge of the students.

One of Dwyer's major conclusions was that small amounts of realistic detail (usually single line drawings) constituted a more effective visual aid when the subjects received group-paced instruction. He suggested that organisms are limited in the amount of input information (both relevant and irrelevant) which can be effectively processed, and that self-paced instructional methods allowed subjects more time to interact with the visual, and therefore to process more information. French (1952) found that subjects consisting of eleven year old children and elementary school teachers (sic) preferred relatively complex pictorial stimuli while six and seven year olds preferred simpler visual stimuli. Travers and Alvorado (1970) suggested that these results indicated that 'the increased capacity of children to handle perceptual complexity .... comes with age'.

Dwyer (1971, 1976) reported that colour was more effective than black-and-white when line and shaded drawings were used and suggested that this may be due to the accentuating effect of colour on the realistic detail. This he attributed to the increased motivation and student interest provided by colour illustrations. As a result of his studies, Dwyer concluded that the 'realism continuum' is not a reliable predictor of learning efficiency and that simple line drawings in colour are most effective for instruction.

King (1972) studied the effectiveness of various combinations of geographic text, photographs, maps and 'illustrations' with 12 year old pupils, and concluded that the narrative of a text book must carry the burden of information to the students without significant reliance upon the accompanying illustrations.

A similar result was achieved by Peletti (1973) who used a specially prepared series of text books ranging from entirely textual to entirely graphic with ten to twelve year old pupils. Although his results were somewhat inconclusive, they did show that students who used geography texts with graphics in the role of primary communicator required a longer time to complete the unit than those who used graphics in the role of reinforcement or who used texts without graphics. It should be noted once again, that the role of the teacher in this work seems to have been solely to administer the test and that the research only has relevance in the context of students working with text without teacher assistance.

Jahoda et al. (1976) studied the ways in which pupils of secondary school age from Europe, Africa and India learned from pictures. Their results, contrary to those of Magne and Parknas (1962), showed that there was no difference between learning from pictures and learning from text. While information presented in both modes was learned more effectively than information presented in text form only, information available only in the pictures was not learned. These researchers suggested that pictures had the effect of increasing attention and motivation.

Nicholson and Seddon (1977) investigated the influence of secondary depth cues on Nigerian schoolboys' understanding of spatial relationships in pictures. They compared monochrome photographs with a series of linedrawings of varying complexity, and found that increasing the number of depth cues in the drawings increased understanding of picture depth. These researchers concluded that photographs have no educational advantage over well-drawn line drawings.

Thomas (1978) investigated the effects of colour photographs and simple line drawings on nine year olds' learning from science textbooks. He concluded that the inclusion or exclusion of pictures in elementary science text books does not influence the comprehension of the material.

Neie (1979) pointed out that the photographs included in Thomas's study were not necessarily included in the text to enhance comprehension and may well have been there to add interest. He suggested that 'we should not conclude that pictures are irrelevant to the comprehension of textual passages; rather we should research the relationship between comprehension and types of pictures or illustrations'.

Haring and Fry (1979) investigated the effects of pictures on the narrative text comprehension of nine year old and eleven year old children. The results showed that pictures enhanced recall of only the main ideas, or top-level structure, even though one set of pictures used in the study depicted both top level structure and lower level structure.

Duchastel (1981) investigated illustrations in a retentional role. His hypothesis was that since illustrations are more easily learned and remembered than prose, an illustrated text will be better remembered than the same text un-illustrated. The illustrated text was presumed to be encoded both verbally and through imagery, so that remembered illustrations could serve as cues for the retrieval of the verbal ideas associated with them.

The results of the experiment only partially supported the hypothesis since the illustrations appeared to enhance retention of information in both illustrated and un-illustrated paragraphs. Duchastel suggested that this may have been due to a generalized attentional role of illustrations in addition to a specific retentional role.

Flagg and Weaver (1981) compared reading comprehension of expository and narrative text in situations where a picture was shown before the text was read, where a picture accompanied the text and where text only was provided. The pictures portrayed the main action for narratives and the main subject for exposition. They found that the study of pictures seemed to be correlated with ability to recall less important detail and suggested that the pictures may provide a mental image which can assist readers to recall details. In a second study they found that while the ability of better readers to remember less important details may have been impaired by pictures, poorer readers were helped. The researchers emphasized that their findings related only to pictures which were redundant to the text.

Brody (1981) acknowledged the work of Dwyer in comparing the effects of specific pictorial attributes, but criticised much of the research in this area on four counts:

i) much of the research is based on materials which are either shorter or simpler than those usually found in school;
ii) the physical or perceptual characteristics of the visuals are usually compared rather than their intended purpose;
iii) much of the research has been based on the assumption of a 'realism continuum' which has been shown to have limited use as a predictor of learning;
iv) many studies define learning only in terms of the transfer and replication of knowledge and information, and omit behavioural outcomes such as thinking strategies and intellectual skills.

Brody called for greater attention to be paid to the functions of pictures as suggested by Knowlton (1966), who suggested that the effects of pictures may be closely related to instructional intent or purpose, and Salomon (1979) who suggested that pictorial attributes should be examined in terms of their relationships with the internal conceptions of viewers.

Kidston and Elkins (1984) reviewed the taxonomies of pictures suggested by Beiger (1982) and Pine and Beiger (1980) in which they averred that there was agreement as to the essential elements of pictures. In their own study, Kidston and Elkins found this not to be true. They cited the work of Anderson (1977) and Bransford and Johnson (1972), in which it was demonstrated that prior knowledge (schemata, mental set) influences the meaning which readers construct from text, in support of their suggestion that similar processes may operate in the reading of pictures. They concluded that whether information is conveyed through pictures or text, meaning is attributed through the interacting processes of prediction, attention to the stimulus and confirmation. They quoted Warren, Nicholas and Trabasso (1979) who said that 'in understanding a narrative, a listener makes only those inferences relevant to the progress of the narrative', and suggested that such a process may also be applicable to picture comprehension. Kidston and Elkins concluded that:

i) teachers should ensure that children's attention is drawn to the relationships between words and pictures;

ii) it can not be assumed that the meaning which different children create for pictures will necessarily be identical;

iii) assisting children to make best use of text illustrations may involve ensuring they are trained in processing the conventions used in the pictures and careful questioning to guide their construction of meaning.

d) Pictures as advance organizers

A number of workers have suggested that pictures may serve as advance organizers by providing a structure into which the learner may fit the information subsequently provided in textual form. Weisberg (1970) found that both a graph and a map proved to be more effective visual advance organizers than a verbal description of the ocean floor before a verbal discussion of "the features of the North Atlantic Ocean Floor as an illustration of the Theory of Continental Drift".

Brody and Legenza (1980) hypothesised that if pictures act like inserted questions then the location of pictures may be important; that pictures placed after the passage should have a greater impact on 'incidental' learning than pictures placed before the passage; and that pictures which provide an overview of an entire scene should increase incidental learning more than pictures that represent a single incident from the reading passage. Their research supported these hypotheses.

d) The effect of humorous illustrations

Although not strictly representational, it is proposed that cartoons selectively portray some imageable quality of a perceivable phenomenon and hence should be included here. The research reviewed above suggests that cartoons have the potential for both motivational and retentive effects on learning. Various studies (Kaplan and Pascoe, 1977; Zillman et al., 1980) have shown that humour can aid learning and retention in lecture and television presentations, even when the humorous incident is of marginal relevance to the topic. Relatively little research can be found relating to the use of humour in text books. Bryant et al. (1980) showed that the frequency of use of humourous illustrations enhances the appeal of texts and reduces their powers of persuasion, while information acquisition and student motivation are apparently little affected. Although the use of humour did have effect on the motivation of students, this effect was less with more difficult passages and seemed to have greatest effect on relatively easy passages. The use of humour contributed greatly to the decreased authority and believability of the author. Bryant commented that 'this effect occurred under judicious use of very funny cartoons which were judged to be precise illustrations of the educational point. What greater erosion of credibility occurs from the use of a marginally related 'Peanuts' or 'Doonesbury' cartoon intended primarily to 'jazz up' the material?' Bryant interpreted the finding that humour worked best in the less difficult material as supporting the notion of 'education by entertainment' since students at a relatively low level may begin with easy reading lightened still further by humorous illustrations.

F. Summary of research related to learning with illustrations in print

A number of researchers have proposed methods of classifying graphic illustrations, while others have examined the ways in which graphic illustrations are retained in memory. It has been suggested that pictures are better than words for depicting spatial arrangements and, through certain conventions, temporal relationships. By providing concrete referents, pictures may also encourage the reader's imagination of information which is difficult to verbalize.

There is considerable uncertainty about the effects on learning of pictures with text. Some researchers have suggested that pictures interfere with the pupils' comprehension of the text, while others have shown that comprehension has been improved. Most of the research neglected the effect of the teacher on pupils working with illustrated text book materials, while many studies failed to distinguish between the effects of pictures which carried the same information as the text and pictures which carried information not repeated in the text. Pictures have been shown to serve as overviews and to prepare readers for the information contained in the text. No studies could be found which examine the uses made of pictures in teaching nor the extent to which pupils reading a text book refer to the pictures.

C. Non-representational illustrations of conceptual, temporal and numerical relationships: diagrams

a)Diagrams of conceptual and temporal relationships

Albarn and Smith (1977) have described the importance of diagrams in the development of human thought: "The diagram is evidence of an idea being structured - it is not the idea but a model of it, intended to clarify characteristics of features of that idea" (p. 7). In addition, both Macdonald-Ross (1977a) and Sless (1981) cited examples of eminent scientists who have explained how visual modelling helps in the development of theory.

Macdonald-Ross (1977a) distinguished two types of diagrams which may be included in this section: scientific diagrams which are used to explain or illustrate, especially by identifying and labelling key parts; and technical or operational diagrams which help the user to carry out tasks. He added that diagrams may have more than one purpose, and quoted the example of a biological diagram which may be both iconic and explanatory. Macdonald- Ross stated that experimental studies on scientific diagrams are few and far between. He commented that the diagrams used by Dwyer (1972) were not up to the best standards of biological illustration, and also criticised the terminal tests used by Dwyer as consisting of rote-recall and low level comprehension items. He concluded that perhaps Dwyer's studies showed that the quality of a graphic device is more important than the choice of format.

Holliday (1973) in his review of pictorial research related to science education commented of Dwyer's work that "few experienced biology teachers ... would have chosen either the picture of the heart model or the photographs .... to teach any of the objectives associated with the four criterion tests". Holliday also cited Burdick (1959) who investigated the contribution of selected cross section drawings typical of secondary science text books to reading comprehension of related verbal materials. He found that the pictures did not contribute to reading comprehension.

Holliday (1976) cited Gropper (1970) and Spangenberg (1971) who showed that flow diagrams represent a more effective instructional medium than a text description explaining the same verbal chains. He also cited work by Fleming (1962), Anderson (1970) and Samuels (1970) which showed that when information is presented through two media, such as a flow diagram and text, the learning effect may not even equate with that attainable through the use of the 'better' medium if used alone. Holliday explained this in terms of Underwood's (1963) principle of least effort which suggests that students do only the minimum amount of attending to instructional stimuli necessary to meet the teacher's demands. He designed an experiment to test this using the oxygen, nitrogen, carbon and water cycles which are conventionally presented in secondary science (and geography) text books in two-media form. Results showed that the teaching effectiveness of a single flow diagram was greater than a textual description alone and also more effective than a combination of diagram and text. Holliday cited Rohwer (1971) who, in his attack on 'the sacred cow of reading', claimed that no persuasive evidence existed to support the common assumption that a text represents the optimal display type.

Main and Griffiths (1977) investigated the effects on comprehension of providing a diagram with text, using a passage on 'Mountains and Rainfall' together with a conventional text book diagram portraying the 'chinook' effect in the Western Cordillera and a textual summary of the essential points of the text. Their subjects were U.S. Naval conscripts. The diagram was designed to add no information which was not also contained in the text, and all content was directly related to learning objectives. The results showed that although all the supplements to text led to improved learning, the diagrams had no greater effect than either printed or audio supplements. The researchers suggested that the extra cost of producing illustrations may not be justified in terms of information acquisition.

Maddox and Loughran (1977) found that tertiary students preferred to see diagrams built up in front of them as opposed to progressive disclosure or presenting the completed diagram. They explained this on the grounds that since oral explanation was synchronized with the visual development, better understanding was likely. Students could 'learn as they went along'. This may have some implications for the study of text book diagrams in classrooms whereby the teacher 'talks through' the diagram with the class.

Macdonald-Ross (1977a) cited a number of workers who have investigated the importance of systems diagrams designed to help workers set up, operate, maintain and repair complex equipment, but emphasized that the effects of such diagrams are as much influenced by the quality of the task and systems analysis on which they are based as on the qualities of the diagrams themselves. Such diagrams do not appear to have much currency in classrooms.

Ordinary language algorithms which show rules, procedures and instructions in non-continuous prose have been discussed by Macdonald-Ross (1977a) and Hartley (1978) both of whom cited numerous studies of their efficacy in a variety of situations. Hartley cited Wright and Reid (1973) who found that algorithms are most suited to complex situations, while simpler situations may be more effectively clarified by the use of tabular information. Hartley concluded that the best layout in a particular circumstance depends on the objectives of the learner. No studies of their use in classrooms could be found.

Whalley and Fleming (1975) examined the eye movements of students when reading illustrated technical articles. They found that when they repositioned diagrams on the page so that they immediately followed the passage to which they referred, they were more likely to be studied by readers than when the diagrams were positioned on the page to give 'balance' as in the original publication. Furthermore, subjects reported improvements in clarity, degree of complexity and understanding. Stone and Glock (1980) made a similar study of the strategies of university students faced with the directions for assembling a model cart. They concluded that readers were selective in using text and pictures and that they were able to combine information from both sources.

b) Diagrams of numerical relationships

Sless (1981) has explained the differences between the human capacity for handling quantitative and qualitative information. He made the point that the eye has a limited capacity to deal with quantity but a remarkable capacity to deal with pattern. This greater capacity for interpreting pattern over quantity is the reason, Sless considered, for graphs being used to make information more intelligible than would be the case if the same information were presented in numerical form.

Vernon (1953b) was one of the first to research this area and she reported that presenting information in graphic form had no advantage over tabular form for improving understanding, although she conceded that the former may generate more interest. Macdonald-Ross (1977a) has criticized Vernon's work on the grounds that her graphic devices were incompetently designed. He wrote 'a test of a table that has been fairly well set in type against a poor graph or a dreadful pictorial chart is invalid; no general conclusions can be drawn'.

Macdonald-Ross (1977b) has distinguished between those graphic devices which have the purpose of presenting general trends and comparisons and those which attempt to present exact numbers. In this context he discussed the effectiveness of bar charts and pie charts and the learning problems associated with continuously graded proportional circles where it was shown that subjects consistently misperceived the relative importance of the data. Macdonald-Ross cited Meihoefer's (1969, 1973) discovery that errors in perception dropped almost to zero if the circles were stepped and a legend provided. He suggested that on the basis of such evidence, continuous sized and unkeyed circles, segmented bars and three dimensional figures should not be used.

Washburne (1927) investigated the effects on learning of various data presentation formats with several thousand high school students. He showed that the ways in which data is presented can have a marked effect on student learning, but that no one form is more effective in all respects. He concluded that numerical data should never be presented in text form if there are more than two items and that if memory of specific amounts is required, the data should be presented as a table of rounded figures. He advocated the use of questions after a table or chart to emphasize its chief features.

Culbertson and Powers (1959) and Culbertson et al. (1959) found that bar charts are easier to read than line graphs, that grouped line graphs were easier to read than segmented line graphs, and that the elements of bars and graphs should be labelled directly rather than indirectly by a key.

Milroy and Poulton (1978) compared different ways of labelling graphs for improving reading speed and found that direct labelling gave the quickest readings without loss of accuracy. They suggested that reading labels directly appeared to involve fewer steps and depend less upon short-term memory.

Feliciano et al. (1962, 1963) investigated the effects of various forms of data presentation with text on a sample of high school children and housewives (described by Macdonald as 'a fairly unsophisticated general audience'). These studies showed that learning was greatest when bar charts and tables are supported by text.

Macdonald-Ross (1977b, p. 385) quoted Neurath (1925, trans. 1973) :

> "to remember simplified pictures is better than to forget accurate figures" (Neurath, 1925)
>
> "Our charts give as little detail as possible. In this they are the opposite of a naturalistic picture, and especially of a photograph.... It is certainly not necessary for a chart to be poor in details, but all details must have teaching value" (Neurath, 1936)

Wrightstone (1936) is cited by Macdonald-Ross as having found that pictorial charts were generally superior to other formats and in particular that they were superior for locating and interpreting facts and for delayed recall. They were also thought to be more interesting.

Macdonald-Ross (1977b) pointed out that primary source data from social surveys are almost always presented in tabular form and that quite often modified versions are presented to students. He considered that this was because tables are one of the most compact ways to present data and that their only serious weakness is their abstract nature. He cited work by Ehrenberg (Ehrenberg, 1975, 1977; Chakrapani & Ehrenberg, 1976) which suggested that the intelligibility of tables may be improved by:

i) rounding number to two significant digits;
ii) providing row and/or column averages as reference points;
iii) placing the most important comparisons in columns;
iv) ordering rows and columns by size of numbers;
v) setting columns and rows compactly using space to distinguish relevant blocks of figures

Macdonald-Ross also cited research studies carried out at the time of the U.K. conversion to decimal currency which showed that small differences found between tabulated formats used by very bright people tend to become large differences when the tables are used by people of lesser ability.

No studies of the use of tables in classsroom settings or with pupils of school age could be found, other than that by Burnhill *et al.* (1976) which is only of marginal relevance to tables *per se* and that of Selkirk (1981) which was discussed in the section on content analysis.

Macdonald-Ross (1977b) summarized his review of the literature on 'How numbers are shown' by stating:

> "All the formats described work best when accompanied by text. The text should not just repeat points made by the chart; it should direct, comment, explain, and question. Thus text-plus-chart is the usual teaching apparatus."
> (p. 402)

E. Non-representational illustrations of spatial relationships: maps

> "The current situation is that in a discouraging proportion of geography text books maps are used only in the most trivial and naive fashion, if they are used at all."
> (Muehrcke, 1981, p. 32)

a) The complexity of maps

Renner (1939) has written "One cannot simply exhibit a map and expect the student will learn merely by looking at it. The map is about as easy for a beginner to read as a foreign language".

McDermott (1969a) has defined maps as "tools to translate into visual form the verbal results obtained from various fields such as planning, teaching, research and exploration". While claiming that the information in a map is assimilated in a shorter time, generally leaves a greater impression on the reader and is retained longer, he admitted that a map can only achieve these roles if the person using it can both read and understand it. McDermott has defined the roles of maps as:

i) motivating devices to create interest in a subject or concept;
ii) tools for teaching purposes;
iii) sources for geographic information;
iv) vehicles for transmitting primary and secondary information.

Balchin (1970, 1972) classified maps into primary and secondary maps. Primary maps represent the real world where points, lines and areas relate to reality in the form of, for example, individual houses, rivers or fields. Secondary maps represent abstractions from the real world where points, lines and areas relate to abstractions from the real world such as spot heights, contour lines or densities. P. Wilson (1980) exemplified this further by pointing out that a dot distribution map of dairy cattle in Denmark would be chiefly secondary, while its framing physical and cultural features would be primary.

Catling (1978), on the other hand, defined thematic maps as the result of positive discrimination on the part of the map maker to display particular features, to emphasize specific relationships or to enable more detailed analysis of a place. From this he concluded that a street map is as much a thematic map as a map showing variations of climatic regime over a continent.

Board (1967) described the map as a portrayal of reality which is both selective and abstract. Of greatest importance is selection, which limits the number of features which may be portrayed in both number and type. The use of abstraction involves symbolization, with the final symbolic form often bearing little visual resemblance to the real object. To accomplish this selection and abstraction, it is necessary to eliminate extraneous detail. Thus, according to Board, it is difficult, if not impossible, to satisfy the requirements of all potential users.

Sandford (1979) quoted Lobeck's (1957) distinction between reading maps and interpreting them. He went on to explain that:

> "the rivers and towns on a map may be read like the words in a book: the map is eloquent about their existence and their location. But we are left to infer the influence of the river pattern upon the siting and growth of these towns. The map is silent about such relationships, though they can be interpreted by a process akin to 'reading between the lines' of a written passage". (p. 297)

Salomon (1968) has taken this point further by emphasizing that a map is isomorphic to the land it represents. This implies a one-to-one correspondence between the two patterns and a correspondence of relations between the elements. Thus, the asking of hypothetical or interpretative questions will carry the map reader far beyond simple reading of the given data. Salomon distinguished three elements in a map which enable a reader to extract information. These are, firstly, the use of various types of coding simultaneously (including icons, signs, symbols and digital codes); secondly, the removal of the height dimension while maintaining relative position in the other dimensions; and thirdly, the determination of spatial relationships by co-ordinates inherent in the map rather than in relation to the reader. Salomon concluded that a map is a very complex document.

Catling (1978) has pointed out that while the scale of a map can be internally consistent, some maps employ different scales in representing different features while Danzer (1980) provided a sample map from a social studies text book which exemplifies many scale and selectivity problems.

Monmonnier (1977) related maps to general information theory and designed a model (Figure 8) in which the various elements in the process of transmitting a message cartographically from source to destination, together with peripheral 'noise' dislocations and corresponding 'filters', are portrayed.

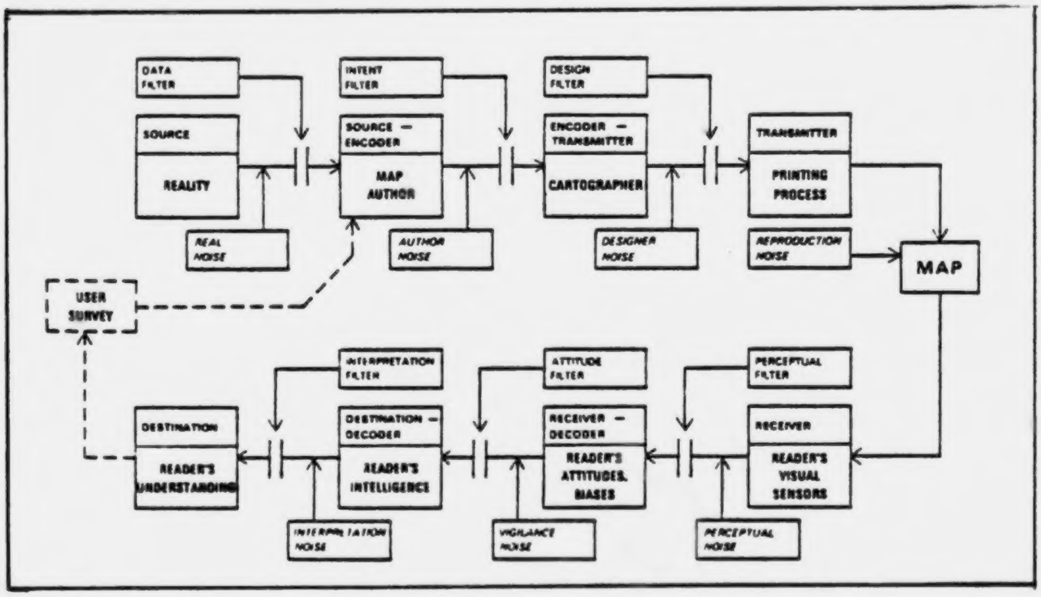

DATA FILTER
SOURCE
REALITY
REAL NOISE
INTENT FILTER
SOURCE — ENCODER
MAP AUTHOR
AUTHOR NOISE
DESIGN FILTER
ENCODER — TRANSMITTER
CARTOGRAPHER
DESIGNER NOISE
TRANSMITTER
PRINTING PROCESS
REPRODUCTION NOISE
MAP
USER SURVEY
INTERPRETATION FILTER
ATTITUDE FILTER
PERCEPTUAL FILTER
DESTINATION
READER'S UNDERSTANDING
DESTINATION — DECODER
READER'S INTELLIGENCE
RECEIVER — DECODER
READER'S ATTITUDES, BIASES
RECEIVER
READER'S VISUAL SENSORS
INTERPRETATION NOISE
VIGILANCE NOISE
PERCEPTUAL NOISE

Fig. 8 . Model of cartographic communication (from Wilson, P., 1980, after Monmonnier, 1977)

Designer and reproduction noise have been the subject of a number of studies. In particular, Bartz (1970a) and Phillips, Noyes and Audley (1977,1978) have investigated the use of different typefaces in map design. Both these researchers used methodologies which involve measuring the time taken to find a name on a map. Christner and Ray (1961) were cited by Phillips et al. (1978) as having shown that search is an important part of many map reading tasks. Bartz (1969) suggested that on some maps finding a feature can be more time consuming than interpreting it. Phillips et al. suggested that search is a good task for evaluation purposes because it involves both peripheral and central vision. It should be emphasized that it is the typefaces which are being evaluated in such work and not the map per se. Bartz (1970a) showed that when people did not know the size of names they were looking for, search times were almost twice as long as when they did have this information. Foster and Kirkland (1971) showed that the same effect occurs for names printed in one of two colours. Bartz also showed that typographic coding is useful only if the map user has a good chance of guessing the size or colour of a name. Without this information, it takes longer to search among names which have been printed in two point sizes than in one. Phillips et al. concluded that typographic coding can clearly save time in finding a name as long as the code is meaningful to the map reader. They commented (1977) that while adults generally know whether they are looking for a town or a village, this is less likely to be so with children, and in that case, a mixture of type sizes is a disadvantage for searching. Bartz (1965) in her study of the difficulties experienced by 10 - 15 year old pupil with atlas maps, observed an inability to distinguish between different type sizes, while Gerber (1982a) confirmed the importance for pupils under fifteen years of maps being presented in a limited number of easily read typefaces. Gerber (1982b) investigated the importance of the positioning of names on black and white maps such as are frequently found in text books. He confirmed that the placement of the names on the maps was very significant for children's map interpretation and confirmed the relevance of Imhof's (1962) guidelines for secondary school map users.

Bartz concluded that the most important symbols on an atlas map are those which form the labels. Children are more conscious of the names on a map than they are of any other element. Furthermore, Bartz claimed that few maps for classroom use are truly simple and set out to make a single point in a clear manner. Instead, she claimed, most maps try to make many points, leading to pupils misreading them as the significant information is lost in the mass of other data.

The question of 'grey scales' such as are used in many monochrome text book maps was investigated by Jenks and Knos (1961). They showed that ranking patterns by the percentage of inked space is not by itself sufficient since the texture of the grey can cause items to appear 'out of order' and advocated that cartographers be wary even when using well accepted scales of grey. Cuff (1973) investigated the use of colour both qualitatively e.g. strong red for high temperatures and strong blue for low temperatures, with pale shades for intermediate temperatures and quantitatively e.g. dark shades for high values and pale shades of the same colour for low values. He found that the quantitative scheme led to the fewest misunderstandings.

b) Characteristics of map users

In contrast with many workers in the realm of textual comprehension, Monmonnier (1977) has maintained that the least controllable variable in cartographic communication is the ability and personality of the map reader, and that the reader's skill cannot be increased easily. Bosowski (1975) has stated: "the extent to which a map user can accurately extract the map author's message from the map depends on the map user's ability to understand cartographic language."

Muehrcke (1981) related abilities in mapping to differences between the functions of the two hemispheres of the brain. He summarized the research which led him to this conclusion as indicating that the left-hemisphere mode of thought is "verbal, objective, analytic, linear, symbolic, logical, rational, abstract, temporal and digital". The right-hemisphere, in contrast, is described as being concerned with components put together to form wholes. "A global view is preferred: whole things, overall patterns and structures are seen instantaneously, often leading to divergent conclusions. Things are seen in spatial relation to other things and the way parts fit together proportionately to make up the whole is understood".

Muehrcke suggested that:

> "Unfortunately, our culture has for centuries been strongly biased in favour of the left-hemisphere development. With its sequenced verbal (reading, writing) and numerical courses, grades and time schedules, our education system is designed to cultivate the verbal, rational, on-time left-hemisphere. In contrast the right side of the brain is lost in our school system and goes largely untaught" (p. 9-10)

For Muehrcke, the map is the essence of geography's contribution to developing 'whole-brained' individuals. He distinguished between maps which are designed to serve a basic reference function and those which are designed to focus attention on a distribution of environmental features. The former are generally of relatively large scale in order to accomplish the purpose of providing detail sufficient for left-hemisphere information processing; the latter, often described as thematic maps, tend to be small in scale in order to assist in holistic, right-hemisphere information processing. He suggested that thematic maps are far more difficult for students to use than reference maps, in part because students have not learned to take full advantage of the potential for visualization provided by the right side of the brain.
Piaget and his co-workers (Piaget and Inhelder, 1956; Piaget, Inhelder and Szeminska, 1960) have shown that children's spatial understanding develops through three stages: topological, projective and Euclidean. The work of Piaget in this area is summarized by Boardman (1983). Catling (1978) linked the development stages of Piaget with the development of children's understanding of three fundamental concepts in geography: spatial location, spatial distribution and spatial relationship while Boardman (1983) commented that a similar sequence may be observed at the conceptual level of development.

Research into children's map reading was one of the earliest areas of geography to receive detailed study in the United Kingdom. Scarfe (1949) reported that for several years before the 1939-1945 war the Training College Committee of the Geographical Association (1941) had attempted to collect data about children's abilities to comprehend contour lines. Since some 40,000 children were involved, this may be the largest single study of its type in geographical education. The results suggested that contour lines were difficult for children to appreciate before the age of ten and a half.

Much of the literature on map reading ability has focussed on young children, especially pre-literate children. In this context Blaut, McCleary and Blaut (1970) claimed that the vertical aerial photograph is the ideal map as it helps to overcome the problem of literacy for it is "a map surrogate that has no legend, no marginal information, and no other notation in the natural language". A number of workers, including P. Wilson (1980), have pointed out that the aerial photograph does have the three basic elements of a map: scale, projection and a set of signs. Wilson described an aerial photograph as "a detailed, realistic, non-selective portrayal of all visible features in a particular area" and suggested that "it could be assumed that this multitudinous detail would make interpretation a rigorous task". McDermott (1969b) and Gerber (1977) found that this is not so. McDermott found that "children in early primary grades can use these materials without too much difficulty", while Gerber found that sign identification and recognition on aerial photographs was substantially higher than for orthophoto or topographic maps for pupils of from ten to fourteen years.

Gerber (1977) investigated the development of cartographic language in children aged ten to fifteen years. He found that year by year performance declined from pictorial maps through to topographic maps while at all age levels identification scores (knowing the look of a sign) were significantly higher than recognition scores (understanding the sign and being able to use it succcessfully on maps). Gerber suggested that the competence in cartographic language in the ten to twelve year olds in his sample was significantly different from that of the thirteen to fifteen year olds.

On the other hand, Prinzing (1974) in a study of aerial photographs with nine and thirteen year old pupils in Chicago found that pupils of both ages reacted similarly and warned that scale still proved difficult for thirteen year old pupils, even with pictorial maps.

Salt (1971) also investigated understanding of large scale maps and found that direction and scale were the least well developed concepts when pupils entered secondary school. He also found that most pupils could handle scale correctly when it simply involved computation but that when they were asked to compare scales, the majority did not appear to have acquired a true understanding of the concept. Boardman (1983) commented that Salt's conclusions support Piaget's contentions that an understanding of proportion depends on the attainment of formal operational thinking and that a true understanding of maps is not achieved until the spatial concepts needed for abstract plan drawing have been acquired.

The ability to generalize from a distribution on a map and to compare two separate distributions was investigated by Heamon (1973). Heamon found that by the age of twelve, about half his sample were capable of perceiving a relationship between two generalized distributions and that this ability had been acquired by nearly all of them by the age of fourteen. Heamon's tests were designed to test Piaget's idea of 'centration', the tendency for children to focus their attention on a limited number of stimuli. Piaget considered that this is illustrated by the tendency for younger children to look for micro-features rather than macro-features on a map.

Satterly (1964), Boardman and Towner (1980) and Boardman (1982) investigated pupils' understanding of contour lines on maps. These workers found that the ability to visualize the solid reality from contour maps develops with age as pupils enter the stage of formal operational thinking, but is still incomplete in many pupils by the time they leave school. Satterley also found that many 14 - 15 year old pupils could recognize the contour representation of landforms when presented separately, but were unable to identify them when they were presented in the context of a complete map. Satterly further found that a psychological test of ability in the perception of embedded shapes was the best predictor of mapwork ability.

Gerber (1984) found that the map design factors of map generalization, map lettering and colour in cartographic signs exerted significant influence on both pupils' use of map language and their interpretative abilities. Map user attributes, which ranged from chronological age to previous map experience and home environment also proved to have significant influences, demonstrating further the complexity of the relationship between pupil and learning resource.

The studies cited so far have all been based on the use of large scale maps. There is also a range of research studies into pupil responses to small scale maps of the type usually found in atlases and frequently included in geography text books.

Bartz (1965) investigated the difficulties in interpreting atlas maps encountered by pupils aged 10 - 15 years in the United States. She found that while pupils understood direction and were familiar with the cardinal points, pupils became confused if the north point was missing from the map. By the age of 12 - 13 years pupils could refer to the line scale to measure simple distances but had not developed any systematic procedure for using the linear scale. Bartz found that the only symbols which pupils fully understood were the black dot to represent a town or city, a star to represent a capital city, a blue line representing a river and a blue area representing a lake or ocean. In addition, pupils found difficulty in identifying countries solely by means of their boundary lines, and confused countries with continents. Bartz also observed that pupils perceived symbols but did not fully understand them. Instead of referring to the legend for help in interpreting the symbols, pupils frequently used some other association they had previously learned. She also observed a general tendency for pupils to interpret maps too literally.

Sandford (1970, 1972) found that pupils displayed a low level of map realism. He observed that errors were often due to the failure of pupils to appreciate standards of size and length and to realise the limitations of a small scale map. As a result, pupils tended to make unwarranted inferences about countries. Sandford concluded that pupils' abilities in the use of atlases were frequently confined to locating named features and using basic techniques involving co-ordinates, direction and scale. Such mechanical proficiency was regarded by Sandford as insufficient if pupils are to have real understanding of the concepts underlying atlas maps.

Graves (1975) summarized the problems revealed by research into pupils' map interpretation in terms of the classroom use of maps:

> "A perceptual-conceptual tendency is that children ... tend to concentrate on limited aspects of the map information. ... an instruction to study a map does not automatically ensure that students will scan the map for broad distributions and patterns; rather they will tend to examine special limited aspects of the map or micro-patterns. ... Thus, instructions have to be explicit, otherwise teacher and pupils will be looking at different things." (p. 150 -151)

c) The use of maps as adjuncts to text

Davis (1968) claimed that all research to that date on map use in school instruction had focussed on maps as primary messages while little research has been undertaken on the effectiveness of illustrations with an accompanying text in promoting pupils' learning. He found that maps in a text served three functions:

i) To carry a specific primary message, i.e. information not available in the narration.

ii) To serve as reinforcers or organizers for the textual narrative. By displaying the message in a fundamentally different way it helps the reader to organize the ideas in verbal form and to abstract from the narrative. (Davis felt that most maps in social studies texts might be classed as organizers or reinforcers.)

iii) To act as decoration to create an image or atmosphere.

More recently, Arnsdorf (1985) has suggested that maps serve three functions in geography classrooms:

i) to present information;
ii) to record data; and
iii) to serve as a basis for quantitative analysis.

Bartz (1970b) commented that social studies text books contained many more maps than previously, but asked 'to what avail?' She commented that 'the actual function of maps, i.e. to tell 'where', is frequently inhibited by an appalling lack of locational 'hooks' on which the thematic information can be hung'. Furthermore:

> 'textbook maps are often very attractive and colorful, and are commendable for being so, but this frequently obscures the fact that they may have only a very limited information content. The maps may look like they might be saying something, but if the teacher or student tries to talk about them, he will find there is little he can say. And if there is little to say, it is likely there is little to remember.' (p. 22)

Davis and Hunkins (1968) reported results of an experiment in which 538 pupils aged twelve to fourteen years were examined in respect either of a narrative on 'The climate of India' or to the same narrative accompanied by a map entitled 'Annual rainfall of India'. Initially, Davis (1968) and Davis and Hunkins (1968) concluded that their results showed that the text with map was more effective than the map alone. Three years later Davis (1971) acknowledged methodological weaknesses in the earlier study and, on re-analysis, found that the map did not have any positive effect on learning. Furthermore, Davis cited work by Miller (1957) and Samuels (1967) which suggested that the map may have served as a distractor or not even been considered, although Levie and Lentz (1982) have commented that the evidence for the distractor theory from more recent work is not persuasive. Davis did make the point that the study was a 'status' study and did not attempt to teach pupils to use a map with accompanying text. He therefore re-stated the substantive finding of the study to be: 'a map with text seems not useful to junior high school pupils in the absence of specific instruction'.

Rhys (1972) posed a series of questions related to prose passages, photographs, statistical tables, maps and combinations of these data forms about various spatially remote areas to a sample of 120 pupils ranging from nine years to sixteen years of age. He reported results which showed that pupils were not able to interweave the component variables and make responses reflecting an awareness of what Piaget and Inhelder (1956) called the 'structured whole' until about twelve years of age. Below that age, Rhys described pupil responses as 'tautological, irrelevant, lacking in premise, egocentric, concrete based and largely descriptive' and he identified the map as offering the greatest cognitive challenge to these pupils. Rhys found that it was not until the age of thirteen plus that pupils develop powers of reasoning with formal-operational thought, thus allowing for an abstract frame of reference. In the context of map interpretation, Rhys commented that the achievement of equilibrium with respect to symbolic representation of unencountered 'worlds' would seem to be critically dependent upon the emergence of a capacity for hypothetico-deductive reasoning.

While Bartram (1980) has demonstrated that spatial information can be learned more effectively from maps than from verbal descriptions, Dean and Kulhavy (1981) investigated further the effects of supporting prose materials with maps. Their results showed that students who used a map relevant to a text passage learned only slightly more than students who saw an unrelated map, but students who saw a relevant map with instructions on how to use it with the text learned some 60% more of the relevant information. Thus the map was a significant help only when processing the information on the map was assured.

More recently, Gilmartin (1982) has reiterated that the explicative role of maps cannot be duplicated by verbal modes of communication. She found that maps helped students learn the content both for immediate recall and for delayed testing. She suggested that the maps may have served an explicative role by conveying spatial information more effectively than did the prose, while on the other hand, if memory for illustrations is superior to words as some researchers have hypothesized, the map may have fulfilled a retentional role. Since the information which was tested occurred both on the map and in the text, Gilmartin suggested that it may have been simple repetition that promoted learning.

Gerber and Stewart-Dore (1982) have suggested that students learn from print information when they extract, organize and translate what they read into forms of information which suit their needs and purposes. They reported a pilot study to test pupils' abilities to undertake verbal and visual transformations. Verbal transformation is the process by which students read a map, decode its message and express its meaning in a written passage. Visual transformation is the reverse process by which students read a written passage, interpret its meaning and draw a map or diagram to represent the writer's message graphically. They found that visual transformations using information explicit in the text was easier for pupils than implied forms of information. For verbal transformations, younger pupils made statements which were "superficial, reflecting the problems which such pupils have with more abstract geographical information."

F. Summary of research related to learning with textual illustrations

Noyes (1979) has pointed out that maps are used for so many purposes that it is important first to define the field of use and to make sure that the necessary information for that use is present. Although Noyes was probably thinking of the various uses of maps, of which their use in education is only one, much research has been cited which shows that even within the classroom, maps, diagrams and other pictures may be included by textbook authors for a wide variety of reasons. The problem in every case for the reader is to discern the author's purpose for their inclusion. In the case of realistic pictures, such confusion may not be too disastrous if the picture is, as in many cases, redundant to the textual content. The readers may miss an opportunity for assistance with the text, but if all else fails, they may assume that it was included to adorn the page and possibly to improve motivatiom. Although the realism continuum has been shown to be irrelevant from the learning viewpoint, it may be suggested that with increasing abstraction, and increasing distance along the iconic-symbolic continuum, this option for alternative functions progressively closes.

Research on the use of diagrams has suggested that information portrayed in diagrammatic form may be learned more easily than that in textual form, depending on the nature of the information. When the same information was presented in both forms, learning was inhibited. This effect appeared to be greater when text and diagrams were separated within documents. Diagrams were found to be most useful when built up in front of students, or when they were labelled and presented after a corresponding description in textual form. When the objective of reading was to follow directions, then tertiary level students have been shown to be able to select between text and diagrams and combine information from both sources.

Studies have shown that the method of presentation of numerical data can have a marked effect on student learning and that numerical data was invariably more understandable when presented separately from text. The method of presentation should depend upon whether the aim was to present general trends and comparisons or exact numbers. No studies of the effectiveness of tables of figures with pupils of school age could be found although Macdonald-Ross (1977b) suggested that all modes of presenting numerical data were most effective when accompanied by explanatory text.

Cons (undated) claimed an aesthetic role for maps which, for him surpassed any potential benefits of pictures. However, the literature on mapping in recent years has shown clearly that the maps in text books are complex documents, and that many of their features are likely to cause particular difficulties for pupils of secondary age whose cognitive development inhibits comprehension of the message of a map. A number of basic principles for the design of maps from the point of view of typography and layout have been suggested, but in much of the research the criterion for success has been speed in search tasks rather than success in tasks which demand synthesis of the two-dimensional information of the map or which help pupils to perform verbal transformations. It would appear from the research on mapping that the benefits accruing from their inclusion in text books are likely to vary with the complexity of the design as well as with the conceptual background of the users which permits them to re-create the intentions of the map author.

The evidence also seems to be strong that, within these constraints, maps can be helpful both in reinforcing information contained within the written text and as carriers of spatial information which cannot be so contained. This can only happen when the maps are processed by the reader, and, as was shown to be the case with written text, the appropriate schemata must be held in order for this purpose to be accomplished. Furthermore, it would seem that, as with other forms of graphic illustrations in textbooks, learners may need strong prompts to get them to process the mapped information (Whalley and Fleming, 1975).

Once again, the role of the teacher in an instructional setting in drawing the attention of pupils to the graphics component of a text book or setting instructional goals, has received almost no mention in the research literature, and will form a major part of the present study.

IV. RESEARCH ON THE EFFECTS OF DIFFERENCES BETWEEN INDIVIDUAL LEARNERS ON LEARNING FROM TEXT BOOKS

Ever since the early work by Burt (1917) and others on the concept of 'general abilities', there has been a continuing interest among cognitive psychologists in the effects on learning of differences in cognitive abilities and cognitive styles. Allen (1975) and Heidt (1977) defined the term 'mental ability' to include a number of traits. Allen cited work by Radlow (1955) and Gagne and Gropper (1965) to support his suggestion that higher ability learners gain more from pictorial presentations than less able learners. Ausubel and Fitzgerald (1962), Allen (1970), Hollen (1970), Berliner (1971), Berliner and Cahen (1973) and Shavelson et al. (1974) showed that lower ability learners gained more from advance organizers.

Salomon (1972) stated that strategies which encourage subjects to pay attention to and differentiate among details benefit lower general ability subjects by compensating for their poor attentional and discriminational skills. Allen (1975) cited Kropp, Nelson and King (1967) to support the suggestion that there may be some optimum level of redundancy for low ability learners: a lack of redundancy would penalize them by straining their information processing capacities; too much repetition may cause boredom.

Witkin et al. (1977) and Ausburn and Ausburn (1977) discerned a number of cognitive styles which are independent of cognitive ability. Grieve and Davis (1971) examined the relationship between cognitive styles and method of instruction in geography. Their results were inconclusive. Greco and McClung (1979) and Satterley and Telfer (1979) found conflicting evidence on the effects of adjunct aids on subjects with different cognitive styles. Clark (1983) cited research by Machula (1978), Saracho (1982) and Clark (1982) which shows that student preferences and achievement from learning from different media may be antagonistic. Students frequently express preferences for instructional methods which are not the most efficient in terms of the students' cognitive styles.

Cronbach and Snow (1977) pointed out that despite expectations that certain definable differences among children interact with characteristics of teaching method, few experimental studies have been successful in identifying these interactions.

V. SUMMARY OF THE RESEARCH PERTAINING TO TEXT BOOKS IN GEOGRAPHICAL EDUCATION

This review of research pertaining to text books and their use by pupils of secondary school age has examined studies which:

I. refer directly to the use of text books in geography;
II. refer to the use of text books in subjects other than in geography;
III. refer to learning from specific modes of printed communication;
IV. relate to the effects of individual differences between learners and learning from text books.

A number of researchers have found that class work based on text books is less popular with pupils than many other activities found in geography lessons, while text books are held in low esteem by many teachers. Only one study was found which investigated the effectiveness of text books in learning geography (Price, 1970) but methodological problems cast doubt on the general applicability of the findings.

The "Effective Use of Reading Project" (Lunzer and Gardner, 1979) investigated the amount of reading pupils were required to undertake in geography lessons. They found that most classroom reading was for very short periods, although more reading for homework was required as pupils moved up the school. They suggested that the low reading requirement reflected teachers' acceptance that pupils would learn little from unsupported reading, but they did not investigate the teachers' attitudes to reading in geography nor other aspects of text book use.

Of those researchers who sought evidence of bias in text books through content analyses, only Wright and Pardey (1982) acknowledged that text books might not be used in the classroom as suggested by their authors or without comment by teachers. Hawkins (1977) showed that map and globe skills in United States elementary school social studies text books lacked progression in skill devleopment, while Selkirk (1981) commented favourably on the way in which mathematical concepts were developed in geography books. Both these researchers pointed out that progression in the text books was of little use if teachers and pupils used books out of the authors' intended sequence. No studies were found which investigated attempts by teachers either to correct possible biases or to maximize the benefits of authors' attempts to create a progression of skill development in their books.

A number of studies have shown that text books vary greatly in their positioning of questions and in the cognitive levels of these questions. While there is some evidence that questions in text books frequently demand low levels of cognitive activity, there is little agreement on the effects of questions which demand responses at various cognitive levels on pupils' learning. None of the studies examined investigated the role of questions in text books or the role of teachers in directing pupils to them.

There are a number of studies on the classification of illustrations and the ways in which pictures are cognitively processed but the research on the effects of illustrations on learning is equivocal. Much seems to depend on the intentions of the author of the graphic device and the reader. As with the research on learning from written text, most of the research on graphics assumes a graphics-reader model while in schools, a graphics-teacher-reader model may be more appropriate. No studies were found which adopt this approach.

Chapter Three describes the methodology adopted to investigate the role of text books and the modes of presentation they commonly use in the classroom teaching of geography.

CHAPTER THREE

THE METHODOLOGY ADOPTED IN THIS STUDY OF THE ROLE OF TEXT BOOKS IN GEOGRAPHY TEACHING

I. INTRODUCTION TO THE RESEARCH

The study of the guidance available to teachers on the use of text books referred to in Chapter One showed that text book usage is, at best, an area of uncertainty. The results of research studies of text books and text book-like materials, and their use in classrooms, summarized in Chapter 2, provided further evidence that the relationship between teacher, pupil and text book is far from simple. Many of the researchers whose work was reviewed in Chapter 2 defined a potential problem associated with text books or teaching materials and then investigated it. Such studies were usually very specific regarding the way in which the printed materials were used, and rarely took the role of the teacher into account. Being interested in the role of text books in geography classrooms, I could find little in the research literature from which to generate specific hypotheses to be tested.

Instead, I found myself faced with what Smith (1980, p.184) has described as 'an educational setting in which a teacher, a class, a curriculum, a school, or complex of educational organizations are going about their activities for their own good purposes'. The aim of this study became, therefore, to attempt to discover the nature of these 'good purposes' and hence how text books are used in geography classrooms under ordinary, every day conditions. I also hoped to discover the factors which influence the ways in which the text books are used.

II. INITIATING THE STUDY

1. INTRODUCTION

The initial approach to this study was strongly influenced by the work of MacDonald (1973a), Harlen (1975) and Parlett and Hamilton (1976), and the, then emergent, concept of illuminative evaluation. As a result of this influence, I had attempted an evaluation of the geography curriculum of a south London junior high school (Lidstone 1977). In this evaluation it was found that a common text book, more or less homogeneous class groupings and ostensible teacher agreement with a common departmental syllabus nevertheless resulted in different classes experiencing markedly different geography curricula. The study bore out, in the context of a text book based syllabus, Parlett and Hamilton's statement, originally based on the evaluation of innovative curriculum materials, that:

> ".... an instructional system, when adopted, undergoes modifications that are rarely trivial. ... Its constituent elements are emphasized or de-emphasized, expanded or truncated, as teachers .... and students interpret and re-interpret the instructional system for their particular setting." (p.89)

Parlett and Hamilton differentiated between the traditional evaluator and those whom they termed "illuminative evaluators". The traditional evaluator: "....examines the blueprint or formalized plan and extracts the

> project's goals, objectives or desired outcomes. From these ... he derives the tests and attitude inventories he will administer. His aim is to evaluate the instructional system by examining whether, for example, it has 'attained its objectives' or met its 'performance criteria'".(p.89)

In contrast, for Parlett and Hamilton, illuminative evaluators base their work on the joint concepts of the 'instructional system' and the 'learning milieu'. While in the context of an evaluation of an innovative instructional package, the 'instructional system' is often 'given', in the context of an investigation into the use of text books, the place of the text book within instructional systems has so far remained undefined. In the words of Parlett and Hamilton: "to switch from discussing the instructional system in abstract form to describing the details of its implementation is to cross into another realm". This other realm is the learning milieu. They consider that:

> "The learning milieu represents a network of cultural, social, institutional and psychological variables. These interact in complicated ways to produce, in each class or course, a unique pattern of circumstances, pressures, customs, opinions and work styles which suffuse the teaching and learning that occur there." (p. 90)

2. CASE STUDY METHODOLOGY

The work of Parlett and Hamilton resulted from a concern with the evaluation of specific innovations, but the techniques involved have become more widely used in educational research and have been integrated under the general term 'case study'. Burgess (1984) demonstrated the connections between the techniques of anthropologists, sociologists, ethnographers and those who have studied schools and classrooms. He suggested that much research of this kind involves a phenomenological perspective whereby researchers attempt to understand the meaning of events for people in particular situations. The focus is upon the way in which participants interpret their experiences and construct reality, while the ultimate aim is to study situations from the participants' point of view. Burgess cited Williams (1981) who showed that those methods which are often termed 'interpretative procedures' owe much to the theoretical tradition known as 'interactionism'. According to Burgess, interactionists put emphasis on understanding the actions of participants on the basis of their active experience of the world and the ways in which their actions arise from and reflect back on experience. Although it is possible to adopt a structural, functionalist, Marxist or other theoretical position in the collection and analysis of field data, Burgess suggested that such models provide orientations to field research which can be moulded and remoulded by the researcher as the research continues.

Case study methodology in educational settings has been discussed at length in many articles, occasional publications and books, including notably, those of Bowen, Elliott, and two by Elliott and Adelman (Ford Project Publications, undated); Macdonald and Walker (1974); Adelman and Walker (1975); Hamilton (1976); Hamilton _et al._ (1977); Norris (1977); Simons (1980); Kushner and Norris (1981); and Burgess (1984). Unlike books such as _Foundations of Behavioural Research_ (Kerlinger, 1964) which claim to be built around 'what is generally accepted as the scientific approach' (p. viii), the writings on case study approaches are rarely prescriptive. Indeed, a surprising amount of the literature is devoted to showing the inappropriateness of positivist or survey research methodology to educational settings (_vide_ Hamilton, 1980). Rather, the use of case studies is described in terms of specific responses to specific situations. Thus, Schatzman and Strauss (1973) have maintained that:

> "The field researcher is a methodological pragmatist. He sees any method of enquiry as a system of strategies and operations designed - at any time - for getting answers to certain questions about events which interest him." (p. 7.)

Similarly, Smith (1980) cited Homans (1962) who wrote:

> "People who write about methodology often forget that it is a

> matter of strategy, not of morals. There are neither good nor bad methods, but only methods that are more or less effective under particular circumstances in reaching objectives on the way to a distant goal." (p.257)

Parlett and Hamilton (1976), wrote that 'illuminative evaluation' is not a standard methodological package, but a general research strategy.

> "The choice of research tactics follows not from research doctrine, but from decisions in each case as to the best available techniques; the problem defines the methods used, not vice versa." (p. 92)

Nevertheless, the fact that case study approaches focus so closely on individuals and their inter-relationships, raises a number of methodological and ethical matters which may be generalized across studies. Foremost amongst such matters is the precise nature of the case being studied and the relationship between the researcher and participants. This relationship is in turn influenced by the degree of prior knowledge of the participants' lives possessed by the researcher. In this study, my own teaching experience raises some potential problems of studying in a familiar setting. Finally, there is the matter of finding appropriate means of gaining access to educational settings, and the level at which such access should be negotiated. Such matters are investigated in greater detail below.

3. DEFINING THE CASE UNDER STUDY

Walker (1974/1980) has pointed out that a key element in many case study research projects is that they involve the immersion of the researcher in the field for a relatively long period of time. Long term study is justified in terms of the need to determine areas of significance and to check reliability and consistency of data. Kemmis (1980) stated that: "the objects of case study are not definable a priori. Creating the case is a kind of bootstrapping process: the objects of case study are created by the observer's and other participants' objectification of them, that is, by rendering them as objects in discourse. In short, the phenomena with which case study is concerned must be created by the observer. They are objects of the imagination". (p. 120)

Kemmis (1980) has claimed that if the objects of case study were determinate, then the case study approach could be defined methodologically. That would require foreknowledge of the cases being studied and make case study unnecessary (except perhaps to pick up details which made a particular case unique). For Kemmis, therefore, the essence of case study is the indeterminacy of the case. He stated that the researcher creates the case by carrying out the study. "He attempts to transform the situation as an object of perplexity into an object of understanding".(p. 117)

Similarly, Smith (1980) has cited Diesing (1971) who described case study as the study of a whole human system in its natural setting. Thus, Geoffrey (Smith and Geoffrey, 1968) began by studying what life was like in his classroom and school, but discerning social class differences between teachers and taught, presented his report in answer to the question "How does a middle class teacher cope with lower class children?" Smith described this approach to educational investigations as using a 'wide net in data collection' (p. 185). Smith summed up this approach by claiming that finding a problem becomes finding a setting and making it problematic.

In the present study, the constraints of time and daily work prevented a complete immersion in the classroom lives of those who became my study participants. Furthermore, my personal involvement in classrooms prevented my approaching the classroom situation as tabula rasa, a situation of which all the teachers whom I approached were, obviously, well aware. For most teachers, any observer in the classroom, or questioning about classroom practice, tends to be associated with the teacher being placed in a position of accountability. I felt, therefore, that I had to justify my interest in the classroom behaviour of professional colleagues. My initial definition of the study for the purposes of potential participants, as well incidentally for my own first steps, referred simply to my concern to understand the use others made of the text books in their classrooms. This decision created what Smith (1980) has described as a 'bounded system', whereby I, and the other participating teachers could define what was, and what was not, the 'case'. As well as providing some direction to the 'condensed case study' (which will be defined further below) the definition of the boundary provided a means whereby my fellow participants could avoid the study entering areas where they might feel particularly vulnerable. By defining certain areas as outside the boundary of the case, they could preserve their privacy. The idea of a boundary was used by teachers particularly when I suggested that I would like to have access to their record books and when I tried to persuade all of them to make audiotape recordings of their lessons. These two contentious areas will be discussed further below. At this point the nature of the case may be summarized as being, at least in part derived from those teachers who agreed to participate.

Having defined, albeit in fairly loose terms, the initial nature of the case, two further problems had to be addressed. These focussed, firstly, on the nature of my relationship with my fellow study participants, and secondly, on the problems of studying in a familiar setting.

4. STUDYING WITH FELLOW TEACHERS

Walker (1974), in pointing out that one of the main characteristics of traditional case study research in the social sciences is the long time span involved, also drew attention to MacDonald's (1974) distinction between autocratic, bureaucratic and democratic modes of research. While the former two modes are based on concepts of impartiality and objectivity, Walker suggested that the democratic mode of evaluation or research has particular relevance in case study research. This approach places case study workers in the position of having to negotiate their interpretations with those involved in the study rather than being free to impose them on the data. For Walker, educational case study within a democratic mode has a commitment to feed information back to participants before time irretrievably changes the situation under study. Walker's answer to the problem of applying case study methods within a democratic mode of research is to think in terms of 'condensed research'.

In discussing condensed case study, Walker commented that one of the main reasons that field work takes so long to conduct is not so much that the data itself demands long immersion in the field but that the mutual trust required in research relationships takes time to create. Thus, despite Simons's (1977) criticisms of Walker's link between condensed research and the democratic mode of research, the present study is based on an acceptance of Walker's (1974) statement that:

> "Unable to produce the authoritative study from personal own resources, the case study worker needs to proceed in such a way that his or her accounts are viewed as tentative and provisional. In admitting the fragility of their own

> interpretations, case study workers might strengthen their accounts by mobilizing the responses of participants as part of the final study."(p. 54)

Accordingly, my aim in the present study was to create a situation, as far as was possible, in which I worked with my participating teachers in an attempt to clarify the role of text books in their particular classrooms, to explore the reactions of their pupils to both the books and their use, and to explain the reasons for, and reactions to, the uses determined. The wider applications of the study in terms of a co-operative investigation of classroom behaviours were also seen by both myself and some, if not all, of the other participants. To this end, the final interpretation of the findings of the various parts of the study was made by the individual participants. My role in relationship to my fellow participants may be summarized therefore as being a colleague, participating in the teaching process and consultant/leader in the investigation process, although the consultant role did not emerge immediately nor was it accepted by all the participants.

5. STUDYING IN A FAMILIAR SETTING

Smith (1980) has described the controversy within the literature of case study regarding the degree to which one theorizes before going into the field. He explained that the controversy has focused on the relative benefits of having no, or minimal, theoretical presuppositions before the project begins, versus having some well worked out point of view that one is trying to test. Smith considered that there is also an in-between stance, that of foreshadowed problems, insofar as such a stance guides the initial observations and assists in the making of tentative procedural decisions and beginning the analysis. He emphasized the dangers of researchers seeing what they want to see, and holding implicit theoretical biases. Smith suggested that in such cases it is important to describe the tenor of the theoretical concerns which the researcher has 'gone in with'. Burgess (1984) has cited a number of studies in education in which the researchers taught classes while doing their research. He stressed that in situations where researchers have teaching experience, while they may be outsiders to the particular schools they join, they are nevertheless familiar with schools, teachers, the teaching profession and the ways in which schools operate. However, Birksted (1976) and Corrigan (1979) argued that such studies are then written from a teacher perspective, and are therefore problematic, as least as far as pupil accounts are concerned. Nevertheless, although Merton (1972) has maintained that "it is the stranger .... who finds what is familiar to the group significantly unfamiliar and so is prompted to raise questions for inquiry less apt to be raised at all by Insiders" (p.33), this option was not available to me in the present study.

Mead (1975) suggested that:

> "To clear one's mind of presuppositions is a very hard thing to do, and without years of practice, all but impossible when one is working in one's own culture or in another that is very close to it". (p. 154)

Like Douglas et al. (1977), my status as an insider, a fellow teacher with my participating teachers, familiar with the cultural settings in which they and I were working, and sharing similar frames of reference, proved to be to our mutual advantage. With the exception of some areas in which my participants felt 'at risk' and unsure, our discussions could take place as between equals in the teaching endeavour. In addition, by working with a number of teachers in a variety of teaching situations, and bearing in mind my own experiences, I tried to adopt what Stephenson and Greer (1981) called an artificial naivete, whereby I could avoid taking things for granted or overlooking situations which at first sight appeared to be familiar.

6. GAINING ACCESS TO EDUCATIONAL SETTINGS

The decision to focus upon natural settings presents problems of selection of subjects. In this study, it would have been possible to focus on a specific text book or type of text book, age and ability of pupils, area of geography curriculum, types of teaching strategy or type of school. In view of the demands I envisaged being made on participants in this study, the first priority was seen as obtaining access to a number of classrooms.

Burgess (1984) pointed out that access has not, until relatively recently, been regarded as a problem by many researchers, being either taken for granted or ignored completely. In many studies in schools and classrooms which have utilized questionnaires, teachers and pupils have been regarded as a docile and accessible population on whom to administer numerous tests and questions. Wax (1971) has suggested that the processes of initiation and resocialisation of the researcher that occur at the beginning of a research project influence the outcome of the final research report. Walker

(1974/1980 p. 49) commented that:

> "To gain access to the school you need first approach the Local Education Authority; to gain access to the staff, you need to approach the Head; to gain access to the pupils you need to approach the staff. Each field work contact is thus sponsored by someone in authority over those you wish to study."

While this is undoubtedly true at the formal level, I felt that within the constraints of 'condensed field work' within which I was operating, there would be little time to develop the type of relationship needed with teachers who may have been coerced participants. Indeed, since the 'case' under examination related so closely to the teachers themselves, I felt that the procedures to be followed in the study should be negotiated from the very start. Accordingly, I approached by telephone a number of teachers of geography with whom I was in professional contact.

Burgess (1984) has discussed a range of sampling strategies commonly encountered in field work research, and in his terms such an initial selection may be described as non-probability sampling, since there is no means of estimating the probability of individuals being included in the sample. My first choice of contacts took the form of a judgement sample, in that I attempted to select teachers of a variety of ages, in a variety of school types and of both sexes, but by virtue of the fact that all were known to me to some degree, the choice may also be described as opportunistic.

My explanations of my reasons for contacting these individuals led in a number of cases to suggestions that other teachers known to my contacts could contribute further variety to my sample, a form of snowball sampling.

At this first contact, I asked merely if the teacher was willing to help me investigate the role of text books in geography classrooms. I explained that my primary intention was the preparation of a report and that I would feed back to the individuals concerned any information I collected in which they might be interested. I stressed my own concerns as a teacher about the uses I made of text books. Finally, I asked individual teachers how, if they agreed to help me, I should approach their Headteachers for

permission to collect information within the schools. While none of the teachers felt that permission was needed for their own involvement in the scheme, all felt that their Heads should be appraised of any plan to involve pupils, and in all cases undertook to make such contact themselves.
Some teachers advised me to follow this up with a letter of confirmation and thanks to the Head; others advised that this would not be appropriate.

While all the teachers expressed interest in my proposal, there were many reservations. These focussed on three main areas. The first area of concern was of confidentiality at a time of great job-insecurity. A number of the teachers expressed concern that my study would reveal what the teachers regarded as weaknesses in their classroom performance and that this information could reach those in positions of authority or power over them.

The second area of concern was of the potential influences of the research on the relationship between the teacher and the class. Concern was expressed that if the pupils thought that the teacher was being studied, then some pupils would seize this as an opportunity to undermine the teacher's position.

Finally, concern was expressed about the amount and nature of the extra work involved in assisting with the study.

Although my own initial stance in the study was to investigate the ways in which teachers use various text books, it emerged from my telephone conversations that my potential participating teachers saw in the study the possibilities of learning more about their own pupils, and the text books they were using. Accordingly, there was some concern that the research should address areas perceived as of interest to the teachers themselves and not merely of interest to an outsider. Reference to 'guinea pigs' was made on a number of occasions and one teacher expressed the views of several when she asked if I had in mind 'just another ticky boxy questionnaire'?

In the light of the three areas of concern expressed by my potential participants, I suggested that I should set out my proposal in writing as a basis on which to negotiate their degree of involvement. In this written statement and first enquiry (reproduced as Appendix B) I expressed the aims of the study in terms of the text book and not of the teachers themselves:

> "I am attempting to discover the extent to which existing geography text books written for the 11 - 16 age group are appropriate to the needs of pupils and their teachers.
> I hope to do this by working with a small group of teachers to analyse how individual text books are used with specific classes and the reactions of teachers and their pupils to the various methods of encouraging learning presented by the authors of those books."

The teachers were asked to provide a list of all their classes, together with details of the text books used and some general guidance as to the ways in which the text books were distributed. Furthermore, in view of the concerns expressed on the telephone about the effect of the study on specific classes and the amount of work involved, they were asked to indicate any classes with which they would not want to engage in any form of enquiry, and the number of classes on which they felt they would be prepared to keep records. From this I intended to select a range of pupil age groups, text books and geography curriculum areas on which to focus the study. In fact, a number of teachers responded in such a way as to indicate very clearly the classes with which they wanted, or were prepared, to carry out the study.

Thus, in Burgess's (1984) term, the teachers adopted the role of 'gatekeepers', taking control of my access to their schools, classrooms and pupils, and incidentally controlling the areas of the geography curriculum, the text books used and teaching strategies available to me for study. In addition to acting as gatekeepers between the pupils and me, the teachers, and through them, the Heads, remained in loco parentis. At no point was it suggested that I should negotiate directly with pupils to obtain their agreeement to their participation. In the event this was perhaps unimportant since my recording of pupil opinions and perceptions was by anonymous questionnaire, administered by the teacher. My contact with the pupils remained at a distance through written assurance that the object of study was the text book and that their opinions of those books would be valued.

7. SUMMARY OF THE INITIATION OF THE STUDY

From an initial concern with the role of text books in geography classrooms, a number of geography teachers were contacted in order that the factors likely to influence a study of text book usage could be explored. The familiarity of the researcher with educational settings similar to those within which the teachers who were approached were working proved to be an advantage in establishing a cooperative relationship. Through the 'gatekeeping' role of the teachers approached, nineteen classes were identified for study, and the text books which were listed as being those used by these classes during that current academic year became the text books on which the study was based. Having identified a group of geography teachers, classes and the text books being used, the next task in the study was to examine the ways in which the books were used in the classsrooms and the composition of the books themselves.

III. INVESTIGATING THE 'LEARNING MILIEU'

Parlett and Hamilton (1972, 1976) have suggested that illuminative evaluation proceeds through three stages: 'investigators observe, inquire further and then seek to explain' (p. 92). In this study, I hoped to discern how the text books were used in the classroom by some form of observation. I wanted to know whether the pupils perceived the text book as being used in the same way as their teachers, the pupils' evaluation of the six modes of data presentation commonly found in geography text books (text, photographs, maps, diagrams, graphs and tables of figures) and the pupils' evaluation of various strategies of classroom teaching in which text books are used. This information could then be used as the basis for achieving some explanation of the patterns of text book usage through discussion with the participating teachers.

1. CLASSROOM OBSERVATION

A. Introduction

Initially, it appeared that the only way to explore the learning milieu was by means of personal observation in a number of classrooms. Classroom observation studies may be classified simply according to whether participant or non-participant methods were used. In the former, observers attempt to become part of the social structure they are observing; in the latter they attempt to remain apart. Furthermore, non-participant observation in educational settings has frequently involved the use of prepared observation schedules. An examination of 'Mirrors for Behaviour' (Simon and Boyer, 1967, 1970, 1975) which contained at that time some 200 observation schedules, mainly American, and 'British Mirrors' (Galton, 1978) which contains forty one schedules, revealed no readily available instrument which encompassed the area of text book usage. Rosenshine (1971) and Dunkin and Biddle (1974) have reviewed various classroom observation instruments and have commented on the problems involved in their implementation, while McIntyre and Macleod (1980) have described a number of ways in which they consider that observation schedules can assist in analyses of classrooms. Delamont and Hamilton (1976) cited Gussow (1964) who suggested that:

> "When the observers are physically present and physically approachable, the concept of the observer as non-participant though sociologically correct is psychologically misleading". (p. 240)

On the other hand, while Elliot (1980) has described participant observation as being a 'method of observing close to the data, of getting into the action sufficiently to begin to see things from the participant's perspective', Burgess (1984) has recorded that when he asked if he could observe teachers in their classrooms, they became 'very defensive'. He suggested a number of reasons for this, including the fact that teachers do not normally have another adult in the room other than in team teaching situations. Many teachers equate the presence of another adult in the classroom with visits by inspectors or advisers for assessment purposes.

For the present study the overriding problem which mitigated against either the development of a more suitable observation schedule or the informal participant observation of a number of lessons, was that of a single researcher engaged as a full time teacher. This made it impossible for me to spend the considerable amount of time during the school day which would have been necessary for such observations to be implemented. Even had such time been available, the use of any observational system presumes that an observer's presence does not influence the normal behaviour of either teachers or pupils. In the context of the use of observation schedules, Medley and Mitzel (1963) commented that 'whatever can be done to minimize the disturbing effect of the observer should be done' (p.306). Samph (1976) investigated the effects of an observer on teacher behaviour and found that teacher verbal behaviour varied with the presence or absence of an observer.

He cited Heyns and Zander (1953) who stated that the most realistic approach to the problem was to keep an observer in the setting long enough to be perceived as a 'piece of furniture', but commented that how long is 'long enough' is still open to investigation. It would appear from Samph's work that the one to three 30-minute sessions suggested by many of the researchers whose schedules appear in 'Mirrors' (Simon and Boyer, 1975) may not be long enough. Furthermore, Hargreaves (1967) remarked:

> "Any adult (who is not dressed as a workman) appearing in school must in their (the pupils') eyes have some strong connection with the teaching profession" (p. 201)

Observation is central to the group of methodologies described as case study, and accordingly, I had to consider other ways of gaining access to the the events of a number of classrooms while bearing in mind the need to avoid any disruption of the normal pattern of interaction. Gold (1958) devised a basic typology of observation roles in which he distinguished four ideal typical field roles: the complete participant, the participant-as-observer, the observer-as-participant and the complete observer. Burgess (1984) explained that while a complete participant conceals the observer dimension of the role so that covert observation is involved, a participant-as-observer develops relationships with informers and participates in the social structure being studied, but makes no secret that his primary aim is observation. The observer-as-participant and complete observer on the other hand make little or no contact with their subjects beyond formal observation.

As Adelman and Walker (1975) have pointed out, "classroom observation is a form of research practised daily by pupils and teachers", and this comment, together with the possibilities offered by adopting the role of 'complete observer' through audio taping, led to the idea of observing-participants. I therefore began to contemplate ways in which participating teachers could record their own classroom behaviour relating to text book usage.

In many schools teachers are required, on paper at least, to keep a 'record book' in which they record the content and activities of all their lessons. It is usually, but not always, a separate document from the 'mark book' which is also usually kept. In my own experience, the status of this record book varies greatly between schools and between departments within schools, and appears to constitute one of the many 'grey areas' of teacher activities. Since most teachers do keep such a record of their activities, it occurred to me that the record book could provide a useful starting point in the investigation of text books and classroom activities. I felt that even the briefest 'record' might include details of a topic heading, the name of any text book used and perhaps a page reference. As part of my early telephone negotiations I raised the possibility of my being granted access to these documents for the purposes of analysing the references to text books contained therein. The strength of reaction was something of a surprise and it was made so abundantly clear by the first four of my contacts that such a suggestion represented an unacceptable invasion of privacy: it lay outside the 'boundary of the case', that I abandoned further ventures into this area. Yet those same teachers who refused to discuss their record books were prepared to keep regular records about their lessons and text book usage, especially if such a record were to be requested in some structured form, and assured me that such a record would be of far more use to me in eliciting insights into the patterns of geography lessons.

B. Teachers' diaries

I began to design a format for keeping records of the use of text book materials in geography lessons. My initial conversations with my fellow participants had revealed that none used group work with their geography classes and so I was able to think only in terms of whole class methods of organization. In the light of these conversations about teaching methods, my own previous work (Lidstone 1977) and my own classroom experiences, I developed a matrix for each lesson on which teacher- and pupil-directed activities were related to the various modes of data presentation commonly found in text books of geography. My intention was to keep the amount of time to be spent in completing the matrix to a minimum, while at the same time collecting information in a form from which it would be easy for me to generalize. I asked four of the teachers who had agreed to participate to try out the matrix for a week, but within two days they were returned to me. With them came comments ranging from accusations of trivialising classroom activities by omitting space for further explanatory comments, to suggestions that the matrix was unintelligible and would take far too long to complete. Fortunately, these teachers were agreed on their preferred alternative, which was a structured diary in which they could record their classroom's activities without trying simultaneously to interpret them. They further suggested that the interpretation of the lessons should be my responsibility while the explanation of the findings should be discussed at leisure.

The revised record sheet for individual lessons is presented as Appendix C. In it the teacher's activities and the pupils' activities are recorded separately and in most cases by means of a "Yes/No" answer followed by a request for more detail. The sections relating to the teachers' activities were presented on a broad continuum beginning with

i) 'Did you teach the lesson without reference to any text book by pupils?' through
ii) the possibilities of helping pupils through the text as presented,
iii) using the text book as a starting point for further explorations of the topic, and
iv) using activities suggested by the author orally; to
v) summarizing important features from the book for the pupils.

The pupil activities section ranged from pupils studying the book alone, either before, after or without teacher explanation; completing author-suggested activities; copying parts of the book; to carrying out teacher-suggested activities. The final enquiry referred to the use of the book for homework.

The record sheets were presented as facing pages in an A5 format diary booklet, to cover twenty-five lessons. The booklet was bound with a bright yellow card cover printed with the London University Institute of Education crest and a brief title for the research project, in an attempt to differentiate the diary from the mass of other paper which fills a teacher's life, briefcase and desk.

Although the diary was originally intended to be an objective record of the teachers' classroom decisions about the use of text books over a period of time, initially envisaged as being a term, continuing telephone contact with my participants revealed that in a number of cases the teachers were monitoring the emerging patterns of their teaching themselves. Long discussions frequently ensued on different strategies of text book use as teachers recognized patterns in their teaching. For example, one participant commented that he had noticed a lack of any work involving statistics in his diary after some five weeks and asked if it would "muck up" my survey if he abandoned the new topic he was about to begin and returned to the previous topic in order to make up for what he regarded as a deficiency. Unfortunately I did not become aware of the role of the diary and telephone calls in changing the behaviour of the teachers until this phase of the study was well under way and so I have been unable to analyse the significance of the study as a change agent. This aspect was referred to by several of the participants in the final interviews in which the whole study was reviewed.

C. Audio-recordings of selected lessons

In Gold's (1958) typology of observer roles in field work, the researcher always adopts the primary role of observer with the participant role, if present, as subservient to this. In this study, observation has been delegated to those who are primarily the objects of the observation. The decision to collect such behavioural evidence in this way has been explained both in practical and theoretical terms in the section of this chapter on 'Classroom Observation'. An attempt was also made to use more conventional methods by asking the participating teachers to make audio-tapes of some of their lessons. It was made clear that not all lessons could be recorded and that the choice would rest with the teachers themselves. I was able to supply tapes and lend cassette recorders where necessary. In the event, this aspect of the study caused more difficulty than any other. I was told by several teachers than no single lesson could possibly be taken as representing their teaching style. The effect of a tape recorder on pupils' behaviour was put forward as further negating the validity of the recording 'for your purposes'. While a number of teachers merely stated that they could not teach effectively knowing that they were being recorded, for others, the recording was always going to be 'done next week'. All the teachers who returned a recorded tape, did so with a verbal comment or a note denying that the lesson recorded was in any way typical of 'normal' lessons, 'that class', or 'what happens when I use that text book'. Although reference to those recordings which were produced will be made in the next chapter, my attempts at persuasion on the matter of tape recording were so ineffective, and had the potential to be so damaging to good relations with my fellow teachers that I would have been better advised to have omitted this aspect from my strategy as quickly as I omitted reference to teachers' record books.

D. Validating the teachers' diaries

The diaries kept by the participating teachers have been described in terms of objective reports of participants' observations of their own practice, the purpose of which was to get a first hand account of what happened from the 'insider' and which could be used as a resource to raise questions and queries from which to generate further data. They may also be classified within Allport's (1942) terms as intimate journals, memoirs and logs. Allport defined a log as a record of events, meetings and visits, but although in this study the intention was for an objective listing of the ways on which the text books were used, the diaries suffer from the subjective nature of any personal document insofar as the relative importance of individual events may be distorted by the diarist. Burgess (1984) summarized the views of a number of writers on the matter of authenticity, distortion and deception in relation to personal documents, but although he suggested that questions of authenticity are rarely applicable to solicited documentary evidence, there is obviously a need to investigate the degree of distortion which may have crept in to the diary records and their interpretation.

Elliott and Adelman (1975) commented that 'the people in the best position to falsify a teacher's accounts of his practice are his role partners, his pupils' (p. 33). This comment assumes that the truth about any phenomenon is unitary. Cicourel et al. (1974) have described a strategy of investigation which they have referred to as 'indefinite triangulation'. This refers to a number of data sources, to a number of accounts of events, which provide details of how various interpretations of 'what happened' are assembled from different physical, temporal, and biographically provided perspectives of a situation. Elliott and Adelman (1976) explained the notion of triangulation further in the context of classroom investigations:

> "Triangulation involves gathering accounts of a teaching situation from three quite different points of view; namely those of the teacher, his pupils and a participant observer. Who in the 'triangle' gathers the accounts, how they are elicited and who compares them, depends largely on the context. The process of gathering accounts from three distinct standpoints has an epistemological justification. Each point of the triangle stands in a unique epistemological position with respect to access to relevant data about a teaching

> situation. .... By comparing his own account with accounts from the other two standpoints a person at one point of the triangle has an opportunity to test and perhaps revise it on the basis of more sufficient data" (p. 74)

Burgess (1984) objected to the term 'triangulation' on the grounds that it suggests only three viewpoints and stated that the term 'multiple strategies' better represents an approach involving a variety of methods, data, investigators and theories used to overcome a problem of bias.

In eliciting the views of pupils, an attempt was made, not to validate the diaries of the teachers directly, since the perceptions of the pupils may not correspond exactly with those of the teacher, but to provide an alternative viewpoint. The differences between the teachers' reports and pupils' perceptions could then form the basis for further investigations in the final interviews with the teachers.

Pupils' views were sought not only on the use of text books made in the classrooms in order to provide comparisons with teachers' reports, but also on their perception of the text books themselves, and their evaluation of the various modes of data presentation and possible teaching strategies.

2. ELICITING PUPILS' RESPONSES

A. Introduction

Douglas (1976) discussed three principles involved in using a mixture of research methods. First, researchers should keep their options open at the start of a project. Secondly, flexibility should be maintained and, finally, uncontrolled methods should be used to determine how controlled methods can be used. Douglas argued that the implications of these principles for the selection of the best mix of methods is that researchers should begin with as little control in their methods as possible and with as much natural interaction as they can. Any movement should be from uncontrolled to controlled methods and from natural to less natural forms of interaction.

The choice of the appropriate means of eliciting accounts of classroom activities from pupils, therefore, rested on both practical and theoretical criteria. In practical terms, the time involved in personally interviewing a sample of pupils from each class involved in the study would have been considerable. Elliott and Adelman's (1975) comment about pupils' views of the accountability roles of visitors and Hargreaves's (1967) remark that 'any adult (who is not dressed as a workman) appearing in school must in their eyes have some strong connection with the teaching profession' (p. 201), suggested that the time available to establish a relationship of some trust with individual pupils would also have been prohibitively limited.

From the theoretical standpoint, I described above how the teachers created and maintained their position as gatekeepers to my approaching their pupils. In this situation no matter how a sample of pupils was selected for interview, those pupils could only be interviewed in school time and with the express permission of the teacher. For the small group of pupils concerned there could be no doubt that their identities would be known to the teacher and therefore promises of anonymity would have had little meaning. Elliott and Adelman in Eliciting pupils' accounts in the classroom (Ford Teaching Project publication,undated) have suggested that one way to overcome the problems of subjective distortion which may arise when pupils feel insecure about giving an honest account of their attitudes and reactions is to elicit accounts in a context which removes the need for pupils to hide the facts about their own and the teacher's conduct and attitudes. In such a context, Elliott and Adelman have suggested that teachers may elicit pupils' accounts not by challenging them to defend their conduct but by asking questions aimed to increase their own understanding of the situation, and that this may be accomplished either through structured interviews or through questionnaires. In another, apparently later but undated, Ford Teaching Project publication, Developing hypotheses about classrooms from teachers' practical constructs, Elliott has written that 'triangulation can be a threatening process' and that 'I had found teachers extremely reluctant in the main to elicit feedback from students, and even those who tried were largely unable to elicit honest accounts'. In view of such warnings, the concerns expressed by the teachers contacted in my first approaches and the the time likely to be involved, any attempt to elicit pupils' accounts by interview either by myself or by the other participating teachers seemed to be ill advised.

In contrast, a questionnaire strategy appeared to have a number of advantages. The questioner would be depersonalised and the respondents given anonymity, thereby lessening pupils' fears about their freedom to give honest accounts. By appropriate coding of questions and responses, computer analysis could be employed, with its concomitant saving of time spent analysing the responses of the marginal pupil, and so enable all pupils involved in specific classes to be included.

B. The Pupil Questionnaire

The decision to use a questionnaire strategy to elicit pupils' reactions to the various elements of their geography classes pertaining to this study, and the possibility of using computer analyses of the data so collected, mitigated in favour of a questionnaire design which could be rapidly and easily coded for computer input. Accordingly, a combination of Likert ratings and Osgood's Semantic differentiation technique was deemed most appropriate. The questionnaire was designed in four sections; the Likert scales being used in the first two and the Osgood technique being used in the second two sections. The complete questionnaire is reproduced as Appendix D and the 'Notes for the administration of the pupil questionnaire on geography books' are reproduced as Appendix E.

a. Pupil perception of text book structure and usage

The Likert scale was designed by R. Likert (1932) and permits a numerical value to be attached to the strength of agreement or disagreement of a respondent to a statement. This technique could, therefore, be used to measure pupils' perceptions of the frequency with which they came in contact with various modes of data presentation in their geography classes.

The initial written enquiry of the participating teachers had asked for details of the text books which were being used with each class during that year. In many classes, up to six different text books had been used during the course of the school year, but on closer examination and discussion with the teacher, the teachers suggested that rarely more than three books were used with any frequency. In the first section of the questionnaire, therefore, information was requested on the pupils' perception of the ways in which the authors of these three text books made use of the various modes of data presentation. Pupils were asked to rate each book in terms of the degree to which they felt that photographs, tables of figures, maps, diagrams and written descriptions were used in the books. This was to test the expectations pupils would have when specific books were presented to them in class. A five point Likert scale was used and the significance of each of the points on the scale was defined verbally. Although the administering teachers were asked not to issue copies of the books to the pupils, they were asked to have a copy of each book visible in the room in order to ensure that each pupil was reminded of the book to which reference was being made.

For the second part of the questionnaire, it was assumed that pupils would have difficulty in remembering specific references to specific books by their teachers. They were asked to indicate the extent to which they thought they had used each of the modes of data presentation during that school year. The five point Likert scale was again used, and the significance of each of the points verbally defined.

b. Pupil evaluation of text book components and usage

For the final two sections, Osgood's Semantic Differential Technique (Osgood, Suci and Tannenbaum, 1957) was used. This technique was originally developed as an instrument for the measurement of meaning, but has become a widely used attitude measurement instrument. Osgood et al. postulated "a semantic space, a region of some unknown dimensionality and Euclidean in character, and defined the space in terms of that number of orthogonal dimensions or axes which exhausted the dimensionality of the space". They discovered by factor analysis that three dimensions which they called "evaluation", "potency" and "activity" factors were of greatest general applicability. Of these three dimensions, Osgood et al. found that the evaluative dimension could be identified most closely with what is commonly known as "attitude". Factor analyses of large numbers of adjectival pairs showed that they fell into clusters and that those clusters which were described as "evaluative" were approximately twice as common as those which were described as illustrating a "potency factor". This technique could therefore be used to measure the attitude of pupils towards various elements of their geography classes. In the terms of Osgood et al., the topics or subjects on which respondents were asked to make judgements are referred to as "concepts" while the pairs of adjectival polar opposites against which each of the concepts is to be judged are referred to as "scales".

i) The choice of scales for semantic differentiation

Ideally one specific scale would be used to represent each of the factors or dimensions of the semantic space, this scale being both perfectly aligned with, or loaded on, its factor and perfectly reliable. In practice, although scales such as "strong-weak" and "rugged-delicate" were both found by Osgood et al. to share ideas of strength or potency, they had slightly different meanings for different people. It was suggested that a number of closely related scales to represent each factor be used. From these scales, averages are derived which are assumed to be both more representative and more reliable than scores on individual scales. These average scores are referred to by Osgood et al. as 'factor scores'.

Osgood et al. have suggested three major criteria for the selection of scales: their factorial composition, relevance to the concept being judged and semantic stability. In view of the findings of Osgood et al. relating to the relative importance of the three basic factors, a decision was made to include four scales relating to the evaluative factor, and one each of scales with high loadings on the potency and activity factors. In previous work (Lidstone 1977), adjectival pairs with high loadings on the evaluative factor had been selected from the tables of variance provided by Osgood et al. From those adjectives which appeared to have greatest relevance to the content of geography courses a pilot survey described in Lidstone (1977) had been carried out. Discussions with pupils at that time had revealed that 'valuable' or 'helpful' and 'boring - interesting' were frequently used in assessing classroom phenomena. Since valuable - worthless appear on the lists of Osgood et al. as having a high evaluative loading, this scale was included in the 1977 survey, although it appeared from the results then that the word 'worthless' did not have great meaning for many pupils. In the present work, this scale was replaced with 'helpful - unhelpful'. The scale 'interesting - boring', although of unknown factorial composition, occurs so frequently in pupils comments on all aspects of school work and seems to be intuitively evaluative to pupils of school age, that it too was included. Finally, 'fast - slow' was selected to represent the activity dimension of classroom activity and 'strong - weak' was selected to represent the potency dimension. Although Osgood et al. prepared their lists by using factor analysis on judgements of a wide variety of concepts, Thomas (undated) has pointed to a 'concept-scale interaction'. Scales found to load on a specific factor will, in a multi-concept analysis, load on the same factor for any given concept. Since in this study all the concepts relate to the study of geography in school, it has been assumed that the loadings of scales will remain constant across the concepts presented. The final choice of scales for these two sections of the survey were "Interesting - Boring"; "Important - Unimportant"; "Pleasant - Unpleasant"; "Helpful - Unhelpful"; "Fast - Slow"; and "Strong - Weak". Although these pairs were presented in the same order for each concept, their polarities were randomly positioned in an attempt to encourage pupils to respond to each scale independently.

ii) The definition of concepts for semantic differentiation

In Section Three of the survey, pupils were asked to judge the various modes of data presentation found in text books on the six scales described above. The six modes of data presentation as defined for this survey were text; photographs; graphs; diagrams; maps; and tables of figures.

In Section Four, pupils were asked to judge the various ways in which they may have been asked to use text books in class or for homework. The classroom applications of the books were derived both from a study of the text books which had been indicated by teachers as being used in their classes and the format of the teachers' diaries described above. Fourteen possible teaching strategies using text books were defined and are listed in Figure 9.

The questionnaire was presented as an A5 size booklet on the cover of which was the Institute of Education crest, the title of the survey and a brief introduction for the pupils. This introduction began by stating that 'You are one of about a thousand pupils who are being asked to give their views on the geography text books they have used in school or for homework'. It was hoped that this would sufficiently distance the survey from specific pupils and their teachers to further avoid the problems of bias. The questionnaires did not carry the names of respondents, and although each was given an identity number for analysis purposes, no record was kept to relate individual pupils to specific questionnaires. The responses were transferred to punch cards and were processed at the London University Computer Centre using the SPSS package.

TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.

2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.

3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.

4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.

5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.

6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.

7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.

8. You are asked to explain some part of the topic in your own words or write an essay about it.

9. Pupils in the class discuss what has been studied with the teacher.

10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.

11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.

12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.

13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.

14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 9. The classroom activities using text books presented in Section Four of the Pupil Questionnaire

IV. ASSESSING PUPILS' ABILITIES TO COMPREHEND THEIR TEXT BOOKS

1.THE CLOZE PROCEDURE

A. Introduction

In the course of my ongoing contact with the participating teachers, reference was repeatedly made to the difficulties pupils experienced with reading the text books and understanding either the information or activity instructions which they encountered. In addition to the information gained from the application of readability formulae to the text books being used, I therefore suggested that we should test the relationship between the pupils' reading abilities and the text books they were using by means of cloze procedure. Since such tests were to be based on the actual text books being used, and they could therefore be regarded as 'revision' to be completed at the end of term, all the teachers were prepared to devote classtime to their administration. In the event, two teachers who were in the process of changing schools were unable to find the time needed while a third was overtaken by end-of-term activities of other sorts and the tests were never administered.

Cloze procedure and the various studies which have been carried out in order to validate it were described in Chapter 2. The procedure was selected in this study in view of the large number of different text books involved and the relative efficiency of the procedure in measuring the difficulty of the books compared with the very time consuming task of constructing test items for conventional comprehension tests. Furthermore, Harrison (1979, 1980) has shown that cloze procedure correlates highly with formal reading tests and thus has high validity, while at the same time being sensitive to individual differences and previous knowledge.

Harrison (1980) distinguished between inter-passage reliability and the reliability of cloze tests on specific passages. With Klare et al. (1972), Harrison suggested that sampling adequacy from within the total text is not a major problem, and in recommending that 'at least two samples per section' should be taken, admitted that this was pragmatic and based on the need for caution rather than on specific analysis of sampling adequacy in cloze testing. Regarding the accuracy of the percentage cloze scores derived from a particular group of readers, Harrison recommended that, to avoid effects which are due to random variation (such as, for example, beginning a sequence of deletions on the fourth word of the passage rather than the third) at least 35 deletions are necessary, although he added that in order to allow a margin of error, between 40 and 50 deletions would be better. Harrison has pointed out that if the number of children who take a cloze test is increased this will itself increase the reliability of the test, and consequently fewer items will be needed. He cited Bormuth (1965) who demonstrated that reliability is increased more by adding a given number of items than by adding the same number of subjects. In the present study the number of subjects was to be decided by the number of pupils in each class present on the day the test was administered. Furthermore, it was necessary that each test should be capable of completion within the span of a single school teaching period.

B. The construction of the cloze tests

In view of the comments made above, single version cloze tests were produced based on a minimum of two passages selected from each book which the teachers had indicated they used with their classes. Each test had a total of fifty deletions or more. Harrison (1980) reviewed the literature on deletion rates and showed that a rate of between fifth and seventh word deletions is most appropriate. However, Klare et al. (1972) have suggested that seventh-word rather than fifth-word deletion is preferable if the readers are comparatively weak or the passage is likely to be found difficult. Seventh word deletion was adopted in this study. Harrison also discussed the significance of the length of the blank spaces which should be left, and in accord with his recommendations, blanks of twelve letter spaces of élite type were left.

C. The administration of the tests

The teachers who administered the tests were asked to emphasize four points, described by Harrison as being 'crucial', to their pupils. These were that:

i) an attempt should be made at every blank if at all possible;
ii) only one word should be put in each blank;
iii) spelling errors will not be marked wrong if it is clear which word was intended;
iv) the intention is not to test pupils themselves but rather the difficulty of the passage.

Printed instructions were also presented to pupils (Appendix F).

D. Scoring the cloze tests

Rye cited Bormuth (1968b) and Rankin and Culhane (1969) as having suggested that scores of less than 40% in a cloze test indicate that a reader is working at a level of 'frustration' with the text, that between 40% and 60% a reader may use the text under instruction from an adult, and over 60% a pupil would be able to read the book independently. These criteria were established on the basis of tests marked with only the exact word from the original text accepted. In order that these criteria could be used in the case studies, and to prevent any subjective element which would result from accepting synonyms, exact word replacement only was accepted. Misspellings were scored as correct provided that no change in meaning or ambiguity was introduced.

For each respondent, the total score for all passages from a specific book were aggregated and expressed as a percentage score. From this, both group mean scores and the distribution of scores for all pupils in a specific class could be calculated. Harrison has pointed out that in considering the readability of text books the grouped scores are more reliable and one could not necessarily make the assumption that each individual reader who failed to score 60% or more is not understanding the passage adequately.

2. CALCULATING THE MEAN CHRONOLOGICAL AGES OF YEAR GROUPS

Finally, since it was also intended to calculate the reading age level of the text books used with each class, the average chronological age of each year group was calculated as on 28th February 1984. This date was taken as being approximately the mid-point of the term during which the cloze tests were administered. In the event many teachers did not administer the tests until several weeks later nearer the end of the term.

V. INVESTIGATING THE 'INSTRUCTIONAL SYSTEMS' THE TEXT BOOKS

1. INTRODUCTION

The ways in which teachers use text books in the classroom may be assumed to be influenced to at least some degree by the nature of the text books available. In some cases the text books may have been selected specifically because they possess certain qualities, in others the teacher may be in the position of selecting aspects deemed to be appropriate from books which do not match that teacher's requirements to more than a small degree.

The text books used by the teachers who participated in this study were therefore analysed from two standpoints. Firstly, a study was made of the structure of the books, in terms of the various modes of data presentation used by the author, and the readability of the text. Secondly, the books were examined for the ways in which the author had entered into the learning processes of pupils through the inclusion or otherwise of questions and other learning activities.

2. SAMPLING THE TEXT BOOKS

A study was made of all the text books used by teachers during the time diaries were kept. A 15% sample of the pages in each book, excepting introductions, indexes and appendices, was taken using the random number generator of the BBC 'B' microcomputer. The computer was programmed to generate sufficient random numbers between 1 and the total number of pages in each book, to indicate a 7.5% sample, and then in each case the two pages of the double page spreads so selected were analysed. Thus allowance was made for text book layouts in which both single pages and double page spreads are planned as units. For the readability tests, to be described below, six sample passages of approximately one hundred words each were selected randomly regardless of the length of the book.

3. THE RELATIVE IMPORTANCE OF THE MODES OF DATA PRESENTATION

The relative prominence of each of the various modes of data presentation was calculated as a proportion of the total print area of each page. As elsewhere in the survey, a diagram was defined as any non-numerical representation of structure while a graph was defined as a graphical representation of numerical data and thus was taken to include such devices as bar charts and pie diagrams. In view of their relative scarcity in more recently published text books, a separate category for sketches and drawings was not included. Such features were included as photographs where their intention seemed to be representational and as diagrams where their intention seemed to be to clarify relational structure.

A record was also made of the degree of integration of the graphics component into the text. The integration was classified as:

i) graphic not referred to in the text;
ii) graphic referred to in the text;
iii) graphic described or discussed in some detail in the text;
iv) graphic used as the basis of a question or activity.

4. READABILITY TESTS OF THE TEXT BOOKS

Harrison (1980) pointed out that the number of predictive readability formulae now constructed runs into hundreds. As was explained in Chapter 2, Harrison (1979), as part of the 'Effective Use of Reading' cross validation study, found that the formulae of Dale and Chall and Flesch possessed the greatest validity and reliability, especially with reading materials intended for secondary school pupils, while the Flesch formula and the Fry graph correlated highly with one another and had the additional advantage of being reasonably straightforward to apply.

Harrison (1980) explained the validity of readability formulae in terms of their correlation with other measures of text difficulty such as comprehension test scores and the pooled ratings of groups of experienced teachers. He emphasized that there is no causal relationship between difficulty level as predicted by a formula and the actual difficulty a reader is likely to encounter since formulae simply measure certain correlates of text difficulty. He found that the Dale-Chall and Flesch formulae and Fry graph had good predictive validity (Harrison, 1979).

Reliability is defined in terms of sampling adequacy, analyst reliability and age level accuracy.

Harrison (1980) quoted Klare (1963) who cited nineteenth century works in the field of stylistics which demonstrated the consistency of an author's average sentence length. Harrison recorded that most formula creators have advised a minimum of three samples of 100 words each, taken from different parts of the book, and added that if the three scores vary by more than three years, a further two samples should be taken. Since this advice is acknowledged as being 'rule-of-thumb', it was decided in the present study to take six samples from each book, randomly stratified to ensure a spread through the whole length of the book.

In terms of analyst reliability, this was described by Harrison as depending on the ability of the analyst to make consistent judgements. The Dale-Chall formula depends on a measure of the ratio of familiar to unfamiliar words, as defined by a list of 3000 words best known by American eight year olds in 1958, together with over 30 rules for deciding which variations of each word are to be considered as 'familiar'. Flesch and Fry, on the other hand, depend on counts of average word length and sentence length. Harrison pointed out that one method of determining whether a variable can be scored unequivocally is to consider whether or not a computer can do the job. All three of the readability measures mentioned may be scored on a computer, although a program for administering the Dale and Chall formulae was not available for this study.

Finally, age level accuracy was examined by the cross-validation study of the 'Effective use of reading' project (Harrison 1979). It was found that, of those formulae known to be reliable with reading materials for pupils of middle and upper secondary school age, only the Dale-Chall formula produced scores with an average of less than half a year's difference when compared with pooled teacher judgements. The Flesch formula and Fry graph have also been shown to produce effective age level predictions, and are much easier and quicker to administer. Harrison (1980) has warned, however, that the relationship between reading level expressed in years and chronological age may have little validity over the age of sixteen, since there is no evidence relating to reading norms for people over this age. Scores of over sixteen years must therefore be interpreted as indicating higher levels of readability difficulty without reference to specific chronological ages.

The present study therefore made use of the Textgrader suite of programs (Mahoney and Meiklejohn,1982) to calculate the Flesch and Fry reading levels of each of the text books encountered in classroom use, based on a sample of six passages from each book. Within the constraints of reading norms noted above, the American grade levels have been converted to chronological ages by the addition of five. The results are summarized in Appendix I.

5. THE ANALYSIS OF QUESTIONS AND ACTIVITIES

A. Introduction

This section is concerned with the questions and suggested activities placed in the book by the author to encourage the learning process. The literature concerning the influence of adjunct questioning on the retention and recall of information contained in text was reviewed in Chapter 2, while the importance placed on skill development and enquiry-based learning in geography by text book authors was described in Chapter 2. In particular the work of Leonard and Lowery (1976), Lowery and Leonard (1978 a & b) and Carrick (1977) was cited as being among the few studies which have investigated the ways in which authors have integrated questioning and activity procedures into their books.

The work referred to above originated as the development of a Textbook Questioning Strategies Assessment Instrument (TQSAI) as part of the Cooperative Teacher Preparation Project at the University of California, Berkeley, (Lowery and Leonard, 1975), under a grant from the American National Science Foundation. Lowery and Leonard (1978a) have described the validating procedures used in respect of the TQSAI. Although the TQSAI was originally developed for use with science and psychology text books, the developers claimed that it may be used to analyse text books in any subject matter area (Lowery and Leonard, 1978). The results of such analyses have been made available, as far as can be determined, only in respect of biology text books (Lowery and Leonard, 1978 a & b), reading programs (Maliverno, Clar and Cutler, 1978) and life science text books (Mayeda, 1980).

B. The Textbook Questioning Strategies Assessment Instrument

The initial classification of questions or activities according to the TQSAI is into two categories: those questions which are deemed to be experiential are distinguished from those which are deemed to be non-experiential.

Experientiality is defined in terms of the way in which the student is involved with the question. A question is judged experiential if that question relates to some activity other than pure mental abstraction or text material. Experientiality may range from the manipulation of experimental materials to the observation of objects, photographs or other graphic presentations.

Questions classified as non-experiential are then placed into one of the following basic question categories:

i) rhetorical;
ii) direct information;
iii) focussing;
iv) open-ended;
v) valuing.

Questions classified as experiential are categorized on a two dimensional matrix in which the basic question categories listed above are further classified on a hierarchy of cognitive processes which includes:

i) observing;
ii) communicating;
iii) comparing;
iv) organizing;
v) experimenting;
vi) inferring;
vii) applying.

Finally, all the questions are classified according to their position in the text, the possible positions being:

i) initiatory;

ii) contextual;
iii) terminal;
iv) captional;
v) marginal.

C. The criteria for the TQSAI

The criteria for question and learning process classification have been described by Lowery and Leonard (1978a):

a) The basic question categories

i) **Rhetorical questions:** Questions which expect no participation from the reader. They are, by definition non-experiential.

ii) **Direct information questions:** Questions which ask the reader to recall or recognize specific information (concepts, principles, laws etc.), which have been read, heard or previously discussed.

iii) **Focussing questions:** Questions which contain clues that suggest what the expected response is to be. Such questions guide the student toward an answer that the author wants to be developed in the student's own terms.

iv) **Open-ended questions:** Questions which do not indicate one expected answer. Such questions invite exploration of relationships and consideration of meanings or implications.

v) **Valuing questions:** Questions which ask for an affective judgement. Such questions invite the reader to formulate an opinion, express attitudes or become aware of the feelings and values of others.

b) The learning process categories

The learning processes which may be involved in answering experiential questions are sequenced along a vertical dimension of the TQSAI. They are defined as follows:

i) **Observing:** Questions which ask the reader to look, listen, touch, taste or smell. Such questions may also ask the student how she or he felt or what thoughts were elicited.

ii) Communicating: Questions which ask the reader to verbalize, write or picture. Such questions may ask the student to furnish a name, offer a descriptive term or verbalize a rule. They may ask the student to state what was helpful or to identify the words which elicited a feeling.

iii) Comparing: Questions which ask the reader to order, sequence, group or classify. The student may be asked to sort into groups, identify the basis for a grouping or provide criteria for a grouping.

iv) Experimenting: Questions which ask the reader to hypothesise or to control or manipulate variables. The student may be asked to identify conditions necessary for results, describe control and experimental situations, formulate experiments on whether and when to change his/her attitudes on the basis of new evidence.

v) Inferring: Questions which ask the reader to synthesize, abstract, analyse, recognize patterns, predict, generalize, or to formulate a theoretical model. The student may be asked to furnish a reason for an occurrence, provide a conclusion, or identify the generalizations that explain the situation.

vi) Applying: Questions which ask the reader to use his/her knowledge or to invent. The student may be asked to embark upon a course of action based on a choice of alternatives.

6. THE POSITIONING OF QUESTIONS IN THE TEXT

The position of the questions and activities are classified as follows:

i) Initiatory position: A question at the beginning of the paragraph or standing alone, preceding the information that is pertinent to that question.

ii) Contextual position: A question which is both preceded and followed by relevant sentences of that same paragraph.

iii) Terminal position: A question which is not followed by a relevant sentence of that same paragraph, or standing alone placed after information which is pertinent to that question.

iv) Captional position: A question which is in a caption associated with an illustration, or which is grouped with other questions but which requires students to refer to an illustration to be answered. (The reference to grouped questions which refer back to an illustration is not included in the original specification for TQSAI, but is included here since it refers to a strategy adopted in a number of geography text books.)

7. SUMMARY OF INFORMATION COLLECTED ABOUT THE TEXT BOOKS

The text books which were available to the various teachers for use in their classrooms were analysed to reveal the relative proportions of the books devoted to data presentation through text, photographs, maps, diagrams, tables and graphs. The ways in which these various modes of data presentation are used in the books were examined, and the readability of the textual component of the books was tested using the Flesch readability formula and the Fry graph. Finally, the questions and activities included in the books were analysed using the Textbook Questioning Strategies Assessment Instrument. With this instrument, information was obtained relating to the types of basic questions asked within the books and the extent to which such questions required student involvement. Finally, information was collected on the positioning of questions within the text and the extent to which the questioning strategy made use of the illustrations and other graphics incorporated within the text books.

VI. DISCUSSING THE FINDINGS OF THE SURVEY WITH THE TEACHERS

1. THE ROLES OF THE TEACHERS IN THIS STUDY

A. Introduction

The relationship between my fellow teachers participating in this study and me has been described in two ways. The teachers were gatekeepers insofar as my access to geography classrooms and pupils was through them. The teachers also provided the definition of the boundaries of the case insofar as they suggested what was public information and what was private, and therefore influenced the direction of the study. Kushner and Norris (1981) have described these roles ascribed to participants in a case study as 'arbiter' and 'plaintiff' respectively. There are two further roles which my participants were asked to fulfil, those of 'expert' and 'collaborator', and these parts of the case study were completed through a discussion or what is often referred to in the literature as 'unstructured interview'.

B. The participating teachers as experts

Kushner and Norris (1981) pointed out that participant validation is crucial to most naturalistic enquiry, especially since, when we try to describe the lives of others, we want to know whether our accounts are 'lifelike' and do justice to the work of the people we study. They emphasized that this is not only a matter of seeking the approval of the participants, but providing an opportunity to improve and extend knowledge. Reference has also been made to Walker's (1974, 1980) comment that the researcher cannot become an expert in the workings of the institution under study, and is unable to become the person who knows the whole story. Walker recommends that the researcher proceeds in such a way that his or her accounts are viewed as tentative and provisional. The participating teacher as expert may then be asked to validate the findings or suggest possible explanations to account for findings which may appear in context to be inexplicable.

C. The participating teachers as collaborators

Walker (1974,1980) has referred to the 'fragility' of the case study worker's own interpretations of case study and, in recommending the inclusion of participants' responses, has stated that:

'it is implicit in the notion of case study that there is no

> one true definition of the situation. Within the confines of the study we act as though truth in social situations is multiple: the case study worker acts as a collector of definitions, not the conductor of truth.' (p. 58)

Furthermore, although Kushner and Norris (1981) commented that the 'final chapter most frequently remains the preserve of the researcher', they too recommended the inclusion of participants' responses to the information gathered as collaborators in theorising about their worlds. These latter workers suggested that it may only be through sharing meaning-productions that we can develop significant understandings of schooling and education.

2. THE INTERVIEW-DISCUSSIONS

Burgess (1984) described interviews in social science research as 'conversations with a purpose', and cited Sidney and Beatrice Webb (1932) as suggesting that an interviewer should:

> "Bear in mind that it is desirable to make the interview pleasing to the persons interviewed. It should seem to him or her an agreeable form of social intercourse". (p. 139)

Further, Burgess cited Zweig (1948) who indicated that the researcher should show interest, understanding and sympathy in the life of the person with whom a conversation occurs, but stressed that this style of interview cannot be started without detailed knowledge and preparation.

I made arrangements to spend an evening with each of my participating teachers either in my own home or in theirs, away from the school atmosphere, where we could examine the results of the various parts of the study together. Mindful of Zweig's (1948) warning that detailed knowledge is an essential precursor of detailed conversation, I ensured that each teacher's own diary was summarized onto a broadsheet; the responses of that teacher's pupils were both graphed and tabulated, and in view of the teachers' interest in the comparisons between their own and other teachers' pupils, where appropriate, the aggregate scores of all pupils in particular age groups and all pupils of all age groups were also made available. Copies of the relevant text books were also to hand.

In order to help me to keep track of the various areas of the study to be discussed and to ensure that similar topics were covered in all the interviews, I began each interview/ conversation by explaining that I had a list of topics that I would like to cover, although I hoped that neither of us would feel constrained by the list, and also that I should like to tape record the conversation so that I would have an accurate account of the matters we discussed. I undertook that the tape recordings would only ever be heard by me, when I used them to write up my final report, and that they would not be used for any other purpose. Nevertheless, it came as some surprise to find that several of the participating teachers found the presence of the recorder to be inhibiting, especially at the beginning of our conversation. Fortunately, the recorder seemed to be forgotten as the tenor of the conversation became established, and frequently the need to change tapes each 45 minutes seemed to come as a surprise.

The list of questions and topics which I wanted to raise during my conversations with the teachers, which I originally called a 'schedule', but which Burgess (1984) has much more accurately called an 'aide-memoire' or an 'agenda', is reproduced as Appendix G. I had originally anticipated that each interview would last approximately one hour, but in the event they lasted between one and a half to two hours, and in order to provide some variation I had prepared one or two questions to be answered on printed charts using Likert scales. These charts are reproduced in Appendix H. Although these questions and charts were used in all the interviews, and the results obtained are included in the reports which follow in Chapter 4, in retrospect their use may have spoiled the atmosphere of cooperative discussion about text book use and the findings of the various surveys, by introducing features of the more traditional accountability-inquisition type of interview.

3. SUMMARY OF THE CONTRIBUTION OF THE INTERVIEW-DISCUSSIONS WITH TEACHERS TO THE STUDY

The final interview with each of the participating teachers was in the form of an informal conversation, away from school. On these occasions I could clarify some of the issues which had been raised by the teacher diaries and pupil questionnaire responses, and the teachers could comment on the validity and relevance to a study of the use of text books of the various investigations. They could also make suggestions as to the organizing principles on which their use of text books in their everyday work depends.

VII. SUMMARY OF THE METHODOLOGY OF THE PRESENT STUDY

This study of the use of text books consists of two strands: that concerning the text books and that concerning the use to which those text books are put in a number of classrooms.

The study of the statements of text book authors as expressed in their prefaces, forewords and introductions, and the advice given in manuals of geography teaching as to the roles of text books in geography classrooms, had revealed a lack of any agreement as to appropriate strategies to be adopted by teachers. A review of the literature on text book and other print material research showed that little is known about the ways in which text books are in fact used in classrooms. A way was sought by which to investigate the role of text books in geography classrooms.

In the light of Parlett and Hamilton's (1976) distinction between the instructional system and the learning milieu, and their definition of illuminative evaluation as comprising observation, further enquiry and explanation, a group of classroom teachers was asked to keep diaries of their usage of text books with selected classes. The pupils in those classes were surveyed by questionnaire firstly, to elicit their perceptions of the degree to which the various modes of data presentation had been used by both the author and their teacher, and secondly to elicit their evaluation both of the individual modes of data presentation and the various ways in which text books can be used in classrooms. The pupils were further asked to complete cloze tests on some of the text books with which they had worked during the year. In the meantime, the text books cited by the teachers as being used with the classes selected were analysed to discern the uses made by the authors of the various modes of data presentation, the readability of the textual portion and the types and cognitive levels of the questions and activity strategies suggested by the authors. Finally, the evidence collected from the diaries, questionnaires, pupils tests and text book analyses was evaluated in consultation with the participating teachers.

This research strategy is summarized diagrammatically in Figure 10.

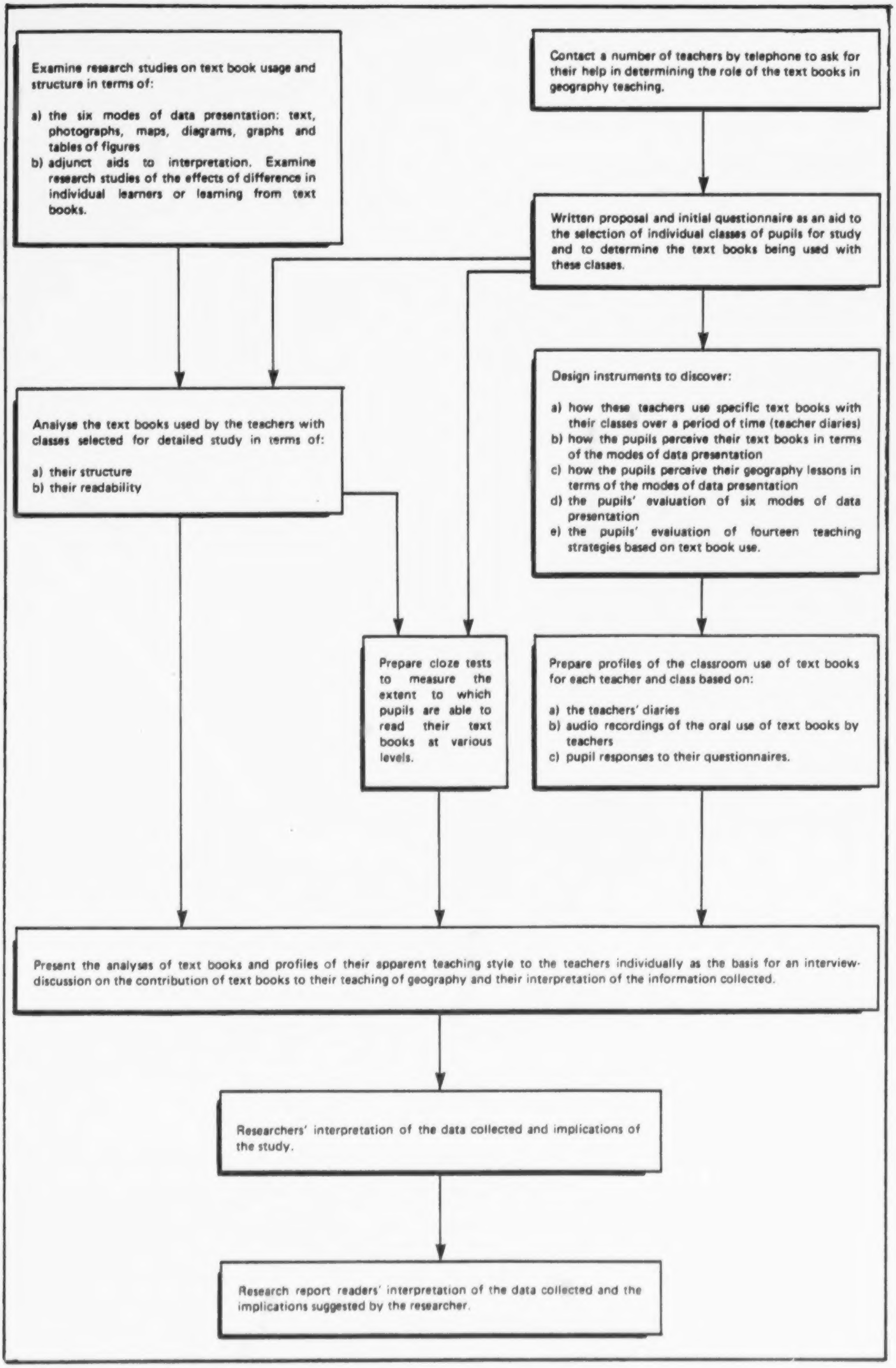

Examine research studies on text book usage and structure in terms of:
a) the six modes of data presentation: text, photographs, maps, diagrams, graphs and tables of figures
b) adjunct aids to interpretation. Examine research studies of the effects of difference in individual learners or learning from text books.
Contact a number of teachers by telephone to ask for their help in determining the role of the text books in geography teaching.
Written proposal and initial questionnaire as an aid to the selection of individual classes of pupils for study and to determine the text books being used with these classes.
Analyse the text books used by the teachers with classes selected for detailed study in terms of:
a) their structure
b) their readability
Design instruments to discover:
a) how these teachers use specific text books with their classes over a period of time (teacher diaries)
b) how the pupils perceive their text books in terms of the modes of data presentation
c) how the pupils perceive their geography lessons in terms of the modes of data presentation
d) the pupils' evaluation of six modes of data presentation
e) the pupils' evaluation of fourteen teaching strategies based on text book use.
Prepare cloze tests to measure the extent to which pupils are able to read their text books at various levels.
Prepare profiles of the classroom use of text books for each teacher and class based on:
a) the teachers' diaries
b) audio recordings of the oral use of text books by teachers
c) pupil responses to their questionnaires.
Present the analyses of text books and profiles of their apparent teaching style to the teachers individually as the basis for an interview-discussion on the contribution of text books to their teaching of geography and their interpretation of the information collected.
Researchers' interpretation of the data collected and implications of the study.
Research report readers' interpretation of the data collected and the implications suggested by the researcher.

Fig. 10. Diagrammatic representation of the structure of the research strategy

CHAPTER FOUR

PRESENTATION OF THE RESULTS OF ENQUIRIES INTO THE ROLES OF TEXT BOOKS IN THE GEOGRAPHY TEACHING OF T EN TEACHERS

Introduction

In this chapter, the detailed case studies of the ten teachers are presented. Studies were made of the way text books were used in either one or two classes taught by each teacher. These classes are referred to by a number representing the year of secondary education of the pupils. Thus Class 1 refers to a first year class in which the majority of the pupils will be of eleven years of age.

For each class, an analysis is presented of the structure and readability levels of the text books used in the period during which the diary of lessons was kept. After their first mention, books are referred to either by their author(s) or their titles according to the present writer's perception of the way in which they will be most readily recognized. The book numbers refer to those allocated to each book in Appendix I. The structure of each book is summarized in tabulated form and further details are presented in Appendix J. The readability levels according to the Flesch and Fry measures are presented in Appendix I. These are summarized in the text and the results of cloze tests administered by eight of the ten teachers are presented in graph form.

The use of text books in specific lessons is presented by summaries of the diaries kept by all the teachers and accounts of the audio recordings made of selected lessons by some of the teachers. The diary summaries are presented in tabulated form and both diaries and audio recordings receive comment.. The period during which the diary was kept is expressed in "sessions" (the number of occasions on which the class and teacher met) and "school periods" (the basic unit of time adopted by each school). "Periods" were invariably of either thirty five or forty minutes. The term "teacher exposition" is used to refer to whole class activity led by the teacher. This may have been a lecture, question and answer session or discussion. The use of the text book was classified as being used for "elements" if the teacher took a part of the book to illustrate a teaching point of the teacher's own creation. The part chosen might be a small quotation, a photograph, map or any other graphic device. The text book was deemed to be used as a "basis" for the lesson if the teacher took the author's basic message and expanded upon it for the class, either by lecturing or by question and answer. The teacher was deemed to teach entirely from the text book if the lesson was devoted solely to ensuring that the pupils understood the author's message. In analysing the various teaching strategies and the use of the modes of presentation, percentages have been given as whole figures. For this reason there may be "rounding errors" in some totals.

The pupils' responses to their books and lessons are presented graphically and a comment is made. In analysing the responses of pupils to the fourteen teaching strategies, a class was deemed to have experienced a particular teaching strategy if over 66% of the class gave a positive response to that strategy. A summary is made of the teaching style of each teacher based on the evidence of the diaries, audio recordings and pupils' responses to the modes of data presentation and teaching strategies.

The report on the use of text books by each teacher closes with an account of the discussion-interview in which the evidence of the diaries and pupil responses were laid before each teacher individually for confirmation and as a basis for interpretation of the use of text books by that teacher.

I. TEACHER ONE

Teacher One was a male graduate in geography with post graduate initial training. He undertook this study three years after beginning teaching. At the time the diary was compiled, he was teaching at a co-educational, inner city comprehensive school, with geography taught in mixed ability classes until the fourth year, when those pupils preparing for GCE Ordinary level examinations were separated from those preparing for the CSE. The teacher kept a diary of lessons with a third year group and a fourth year CSE group

1. CLASS 3

A. The structure and readability of the text books

With Class 3 the teacher used four different text books during the period of the study. These were Asia and North America (Beddis, Book 3), Asia (Poxon and Poxon, Book 39), Oxford Geography Project 3 (Grenyer et al., Book 22) and Problems of our Planet (Maclean and Thomson, 1977). Figures 11a, 11b and 11c are summaries of the analyses of the first three of these books.

SUMMARY ANALYSIS OF BOOK 3: Beddis Asia and North America

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	62	23	9	3	2	2	38
Textual references to illustrations: None:	-	64	83	75	50	100	69
In passing:	-	36	0	25	50	0	28
Detailed:	-	0	17	0	0	0	3
Percentage of illustrations used in Questions/Activities	-	55	67	100	100	100	67

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 31

	Non-experiential	Experiential
Percentage of all Questions/Activities	56	44
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	27	57
Integrating	52	41
Open ended	21	2
Valuing	0	0

Fig. 11a

SUMMARY ANALYSIS OF BOOK 39: Poxon and Poxon Asia

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	45	1	2	1	2	51
Textual references to illustrations: None:	-	14	100	100	100	100	27
In passing:	-	68	0	0	0	0	58
Detailed:	-	18	0	0	0	0	15
Percentage of illustrations used in Questions/Activities	-	41	100	100	100	100	50

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 31

		Non-experiential	Experiential
Percentage of all Questions/Activities		51	49
Percentage of each type of Question/Activity			
	Rhetorical	6	-
	Confirming	33	47
	Integrating	44	47
	Open ended	11	6
	Valuing	6	0

Fig. 11b

SUMMARY ANALYSIS OF BOOK 22: Grenyer et al. Oxford Geography Project 3

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	24	24	6	1	7	61
Textual references to illustrations: None:	-	46	38	25	0	43	40
In passing:	-	8	0	50	0	43	18
Detailed:	-	46	63	25	100	14	42
Percentage of illustrations used in Questions/Activities	-	46	88	50	100	100	58

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 41

		Non-experiential	Experiential
Percentage of all Questions/Activities		30	70
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	19	38
	Integrating	50	57
	Open ended	31	5
	Valuing	0	0

Fig. 11c

Fig. 11. Summaries of the analyses of the text books used by Teacher One. with Class 3

All of these books are written for lower school pupils. They provide a considerable body of descriptive text accompanied by photographs. Maps are a common feature only of Oxford Geography Project 3, while other modes of data presentation are given much less prominence. Approximately a third of each book is devoted to questions and activities and the major thrust of these is in the area of pupils confirming previously acquired factual knowledge and integrating new knowledge. This involves pupils in the processes of communicating, comparing and organizing according to the authors' instructions. While Poxon and Poxon require pupils to draw inferences, these inferences are guided through the use of integrating questions. The illustrations in the books are discussed in detail in the text only by Oxford Geography Project, although Poxon and Poxon integrate the illustrations into the text more closely than Beddis. In all the books the illustrations are used extensively as the bases for questions and activities, and although the numbers of diagrams, graphs and tables of figures are relatively low, their use is invariably as source data for pupil manipulation. Pupils who follow a course based on these books may be expected to concentrate on the content of expository text, photographic interpretation and confirming and integrating their knowledge through the processes of communication, comparison and organization.

B. Record of lessons

a) The written diary

The teacher used a text book in a high proportion of his lessons, especially Beddis and Poxon and Poxon. On most of these occasions he either made no reference to the books during his own exposition, or referred only to individual elements from them, a short passage of text, a photograph or a map. When pupils were asked to study the text book alone, it was usually after the teacher had prepared the topic with them, although pupils were occasionally referred to the text books without teacher explanation. Pupils were required to copy information, usually maps, from a text book in over half the sessions recorded.

Few questions from the text books were attempted orally with the class, but a considerable number of text book questions and activities were attempted by the pupils in writing. The majority of these were experiential in nature and were based mainly on tables with photographs and maps being used much less frequently. Most of the questions and activities were selected from one of the text books, the majority coming from Beddis. The teacher's selection of questions suggests that amongst the non-experiential questions at his disposal, he selected those which were open-ended whilst reflecting the authors' emphasis on integrating questions. In his choice of experiential questions also, the authors' emphasis on confirming questions is reflected in the teacher's choice, to the extent that few questions and activities were selected from Oxford Geography Project 3 Figure 12 summarizes the diary kept by Teacher One of his lessons with Class 3.

SUMMARY OF DIARY OF TEACHER 1 :CLASS 3 :N.= 20

Volume of text book usage: No. of sessions recorded: 20 (30 school periods)
No. of sessions in which text books used: 17 : 85%

Text books used during period of diary (and no. of sessions used):
No.3: Beddis; Asia & N. America (7)Maclean & Thomson; Problems of our Planet (2)
No.39: Poxon & Poxon; Asia (6) No.22: Grenyer; Oxford Geography Project 3 (1)

Of the 17 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 7 (35%); made reference to elements of tb: 5 (25%);
used tb as basis for exposition: 3 (15%); taught entirely from tb: 2 (10%);

No. of sessions in which elements received particular reference:
Text: 8; Photo: 4; Map: 2; Diagram: 2; Graph: 1; Table: 2;

Pupil activities: Pupils studied the text book alone during 11 sessions.
Of these, none were before; 7 were after; 4 were without teacher explanation.

Pupils copied information from the text book during 11 sessions as follows:
Text: 3; Photo: 0; Map: 7; Diagram: 1; Graph: 0; Table: 2

Pupils' completion of Questions/Activities
There were a total of 37 Q/As. Of these 43% were Non-exper'l; 57% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
5 (13%) orally; 32 (87%) in writing (2 (6%) of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk 39:13(35%);Bk 3:19(50%);Bk 22:1(3%); Maclean & Thomson:2(6%);Other:2(6%)

Non-experiential questions (N = 16):
Rhetorical: 0%; Confirming: 25%; Integrating: 44%; Open Ended: 31%;Valuing: 0%

Experiantial questions (N = 21):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	33	10	0	0	43
Comparing	0	10	0	0	10
Organizing	29	5	10	0	43
Experimenting	0	0	0	0	0
Inferring	0	0	5	0	5
Applying	0	0	0	0	0
TOTAL %	62	24	14	0	100

Experiential Q/As referred to data sources as follows (% references, N=22):
Atlas: 5%; Other text: 0%; Photo: 23%; Map: 18%;
Diagram: 9%; Graph: 5%; Table: 41%

Origin of data sources referred to in Experiential Q/As:

%	Bk3	Bk39	Bk22	Maclean & Thomson	Other
Photo	14	9	0	0	0
Map	0	14	0	5	0
Diag	0	5	5	0	0
Graph	0	0	0	5	0
Table	23	9	0	5	5
TOTAL %	37	37	5	15	5

Fig. 12.

b) Audio recording of lessons

This teacher made an audio tape of the first twenty minutes of one of his lessons with this class. The lesson began with a pupil reading a paragraph from the book on the subject of rural-urban migration and the teacher took a number of the terms used in the paragraph to ensure pupils' understanding. During the ensuing question and answer discussion, the teacher asked 61 discrete questions, some of which included a number of subsidiary, clarifying questions. Of the discrete questions most were non-experiential and required integration. With these questions the teacher investigated the pupils' existing understanding of urbanization and the various sectors of an economy. After some ten minutes of such questioning, he turned to experiential questions based on photographs and maps. Most of these required confirmation from pupils. In his oral use of the text book, the teacher appeared to be using the book firstly, as an aide memoire, to discover the extent of the pupils' prior knowledge of the topic and clarify any misconceptions, secondly, to enable him to ensure that pupils would later be able to read the relevant passage on their own and to complete the questions and activities presented by the author and thirdly, to guide the pupils in their interpretation and inference from the maps and photographs.

C. The pupils' responses to their books and lessons

Figures 13a and 13b show the pupils' perceptions of the relative proportions of the six presentation modes in Beddis and Poxon and Poxon.

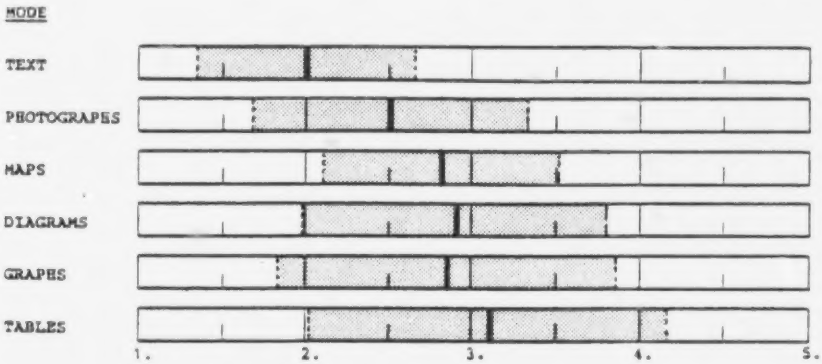


Fig. 13a. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 3 by the pupils of Teacher One, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean). *

*** N.B. In this and all subsequent diagrams portraying pupils' perceptions and assessments, a score of 1 represents a positive response, a score of 5 represents a negative response.**

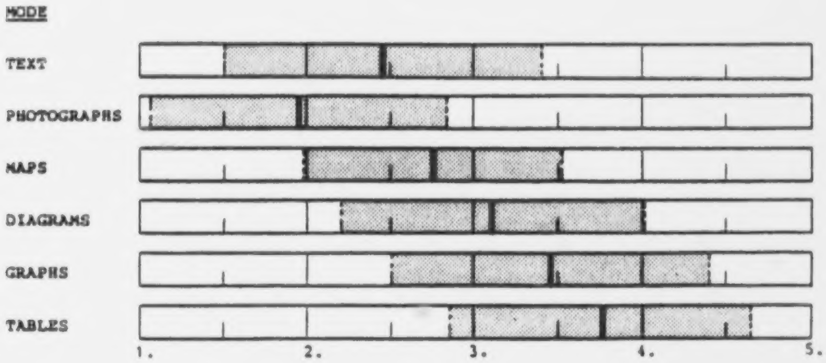


Fig. 13b. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 39 by the pupils of Teacher One, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

These figures show that the perceptions of pupils of the relative contributions of the various modes of data presentation to both of the main text books used in their course are very similar to the relative proportions of print area as shown in Figure 11a and 11b. Their perception of the use of the modes of presentation in their geography lessons differs from the pattern of the books themselves (Figure 14).

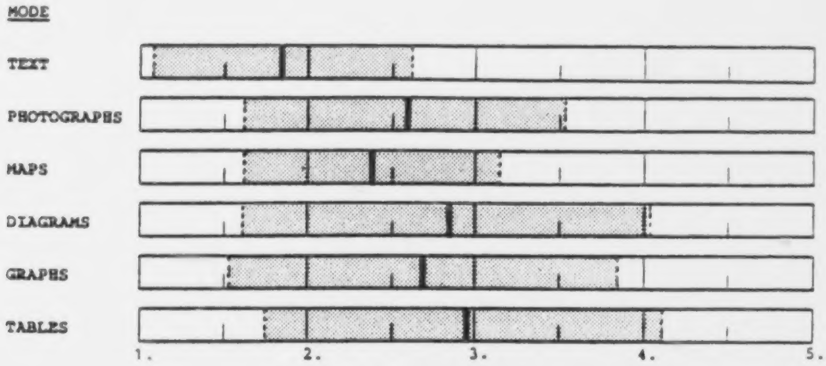


Fig. 14. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher One, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

This figure shows that the pupils perceived the text and maps as being used most, with photographs being of some importance. Graphs, diagrams and tables of figures were not regarded as being used very often in geography.

In their assessment of the value of the six presentation modes, these pupils placed graphs and text as being of most value, with maps, diagrams and photographs following. Tables of figures were not regarded as being of great value. (Figure 15)

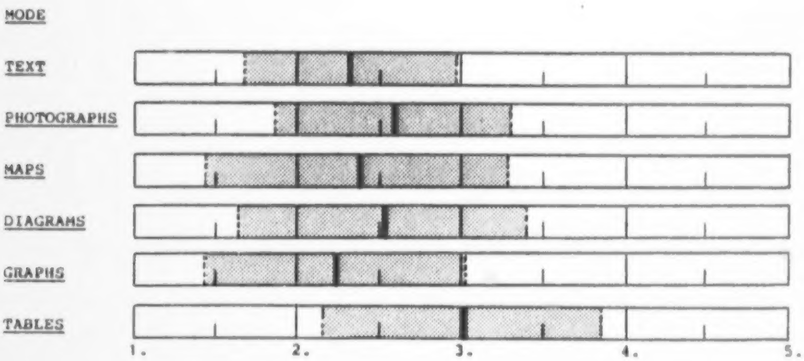
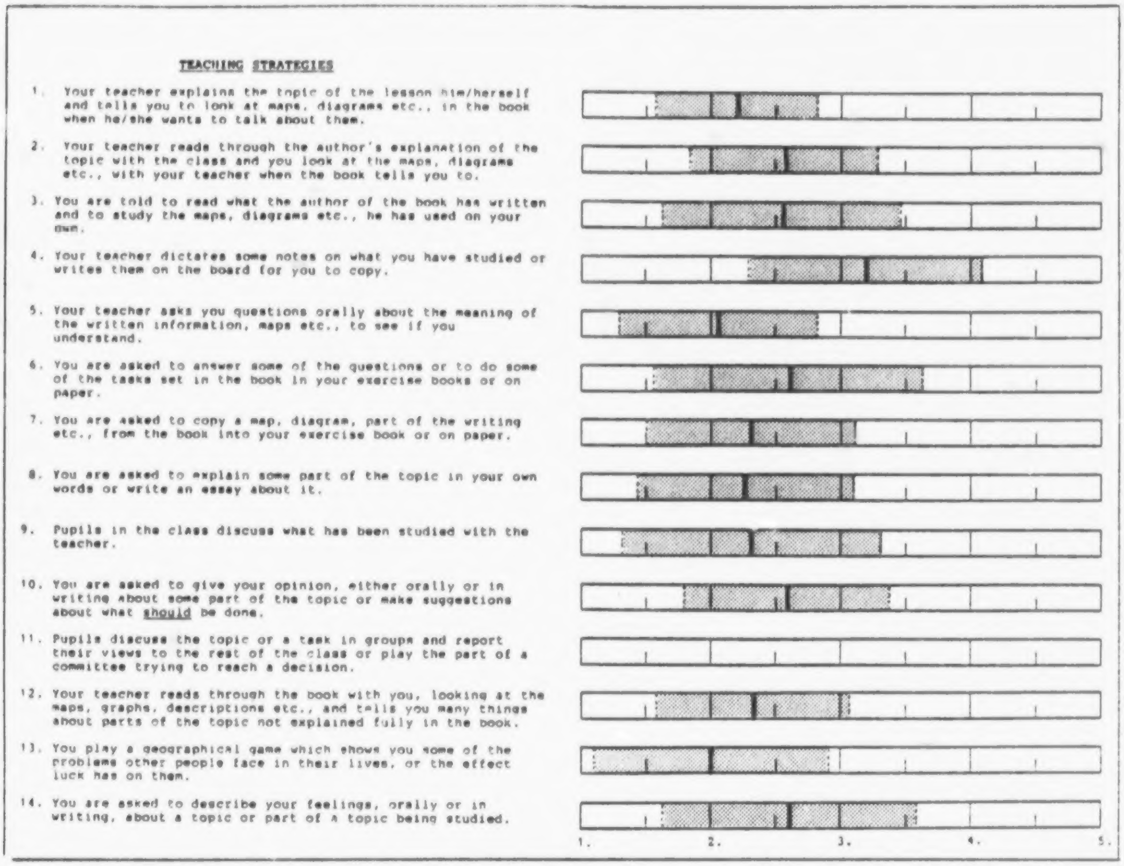


Fig. 15. Childrens' assessment of the six modes of data presentation: Teacher One, Class 3
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 16 shows the pupils assessments of the fourteen teaching strategies based on using text books. Of the teaching strategies valued more highly, Class 3 placed particular value on geographical games (13) and the teacher teaching the class himself, referring to the text book (1) and questioning the class (5). It would appear that these pupils have a very positive attitude towards those strategies which involve them in close oral contact with the teacher. Dictation (4), and text book questions (6) were valued less, as were direct reading from the text book, either by the teacher (2) or the pupils themselves (3). Giving opinions (10) and describing feelings (14) were also regarded as of relatively low value. Although some of the strategies received more positive responses than others, with the exception of dictation, all the strategies received scores which suggest that pupils regarded them as having positive value in their learning.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 16. Pupils' assessment of the fourteen teaching strategies Teacher One, Class 3.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 4

A. The structure and readability of the text books

With his fourth year CSE group, Teacher One used The Land and People of Britain (Beddis, Book 4) and Oxford Geography Project 3 (Grenyer et al. Book 22). Both these books are intended for lower school pupils. Figure 17 is a summary of the analysis of Book 4. Book 22 was summarized under Class 3 above. Both books encourage acquisition of the skills of geography through the use of experiential questions and activities based on maps and diagrams, although with less emphasis on photographs than might be expected from their proportion of the print area. A high proportion of the total text is devoted to questions and activities, which emphasize the confirmation and integration of information. Appendix I suggests that pupils of the age of Class 4 should be able to read this text book with ease.

SUMMARY ANALYSIS OF BOOK 4: Beddis The Land and People of Britain

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	54	26	10	8	1	1	46
Textual references to illustrations: None:	-	11	0	0	0	0	5
In passing:	-	56	100	57	100	100	68
Detailed:	-	33	0	43	0	0	30
Percentage of illustrations used in Questions/Activities	-	44	75	57	100	100	59

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 48

		Non-experiential	Experiential
Percentage of all Questions/Activities		47	53
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	29	41
	Integrating	53	56
	Open ended	18	3
	Valuing	0	0

Fig. 17. Summary of the analysis of Book 4 used by Teacher One with Class 4

B. Record of lessons

a) The written diary

Figure 18 is a summary of the diary of the lessons of Teacher One with Class 4. It reveals that the teacher used a text book in just over half the sessions for which the diary was kept, and that the main text book used was that by Beddis. Although the teacher taught the lesson entirely from the text book in almost half the sessions recorded, in the remainder of the sessions, the book was used either as an aide memoire or was not referred to at all by the teacher in his exposition. The pupils studied the text book alone during three sessions, usually after the teacher had summarized the topic. The one occasion during which the pupils studied the text book without teacher help was during the teacher's absence. The text book was used as a source of information to be copied rarely.

A substantial number of questions and activities from the text books were attempted, the majority of which were experiential. Three quarters of these questions were taken from a text book, and most were attempted by the pupils without the teacher discussing them orally first. While the non-experiential questions and activities usually demanded the integration of previous knowledge, the experiential questions and activities more often required confirmation. The experiential questions and activities were most frequently based on photographs and tables of figures, and while the photographs were usually selected from amongst those in Beddis, the teacher usually supplied the data for questions and activities based on tables.

SUMMARY OF DIARY OF TEACHER 1 :CLASS 4 :N.=12

Volume of text book usage: No. of sessions recorded:12 (20 school periods)
No. of sessions in which text books used: 7 : 58%

Text books used during period of diary (and no. of sessions used):
No. 4: Beddis; The Land and People of Britain (6)
No.22: Grenyer et al.; Oxford Geography Project 3 (1)

Of the 7 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 2 (29%); made reference to elements of tb: 1 (14%);
used tb as basis for exposition: 1 (14%); taught entirely from tb: 3 (43%);

In referring to elements of the books, the main emphasis was placed on a number of photographs. A map was also referred to.

Pupil activities: Pupils studied the text book alone during 5 sessions.
Of these, 1 was before; 3 were after; 1 was without teacher explanation.

Pupils copied information from the text book during 3 sessions as follows:
Text: 0 Photo: 1 Map: 1 Diagram: 0 Graph: 0 Table: 1

Pupils' completion of Questions/Activities
There were a total of 68 Q/As. Of these 29% were Non-exper'l; 71% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
8 (12%) orally; 60 (88%) in writing (16 (24%) of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk 4: 43 (63%); Bk 22: 9 (13%); Other: 16 (24%)

Non-experiential questions (N = 20):
Rhetorical: 0%; Confirming: 5%; Integrating: 80%; Open Ended: 15%;Valuing: 0%

Experiential questions (N = 48):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	8	0	0	0	8
Communicating	10	8	0	0	19
Comparing	10	8	0	0	19
Organizing	23	8	0	0	31
Experimenting	0	0	0	0	0
Inferring	8	15	0	0	23
Applying	0	0	0	0	0
TOTAL %	60	40	0	0	100

Experiential Q/As referred to data sources as follows (% references, N=47):
Atlas: 4%; Other text: 0%; Photo: 45%; Map: 11%;
Diagram: 8%; Graph: 0%; Table: 32%

Origin of data sources referred to in Experiential Q/As:

%	Bk4	Bk22	Other
Photo	45	0	0
Map	9	2	4
Diag	8	0	0
Graph	0	0	0
Table	0	4	27
TOTAL %	62	6	31

Fig. 18.

C. Pupils responses to their books and lessons

Figure 19 shows the perceptions of the pupils of Class 4 of The Land and People of Britain, (Beddis, Book 4). The pupils saw the text as being the major mode of presentation with photographs as being the second most common feature. Similarly, they correctly perceived maps and diagrams as making considerable contributions to the book. These pupils perceived tables of figures to be of equal predominance to maps, despite the low occurrence of tables in the book itself. This supports the impression given by the teacher's diary that tables of figures are used frequently.

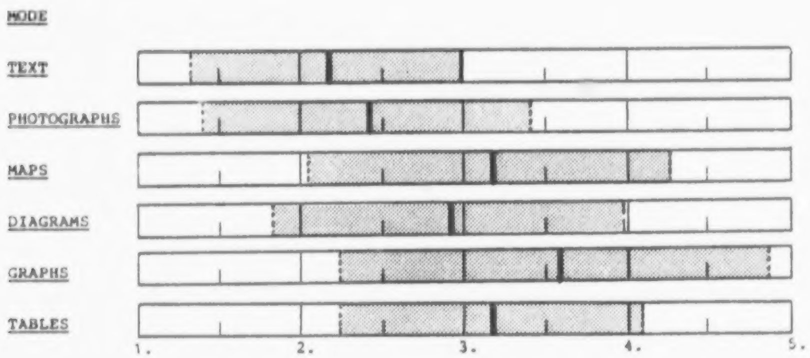


Fig. 19. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 4 by the pupils of Teacher One, Class 4. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 20 shows the pupils' perceptions of the use made of the six presentation modes in their geography lessons. It shows that while text is the most common usage made of the text book in their lessons, maps and diagrams are also used frequently. The photographs which occupy such a substantial proportion of the text book are regarded as being used infrequently by the pupils, while graphs and tables are regarded as being used with similar infrequency.

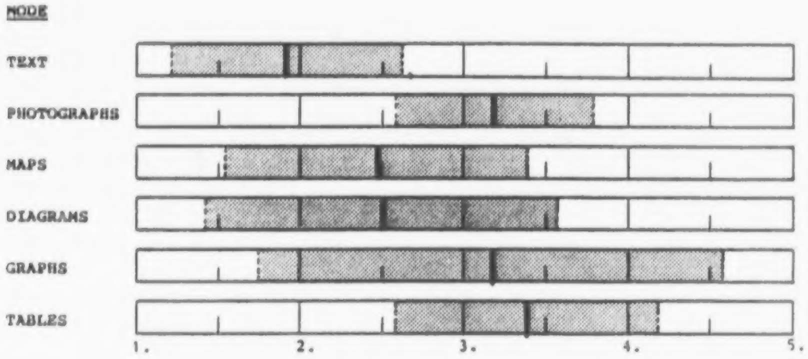


Fig. 20. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher One, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 21 shows the pupils' assessment of the value of the six modes of data presentation to their learning. It shows that while all the modes with the exception of tables of figures are regarded as being of value, diagrams, graphs, and maps are seen as having greatest value. Photographs are seen as having relatively lower value than the other modes.

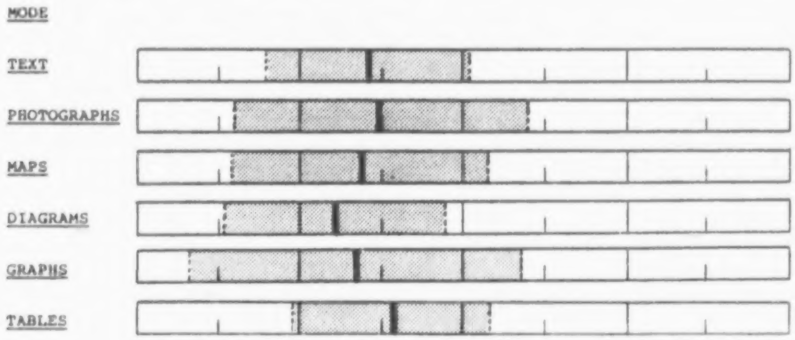
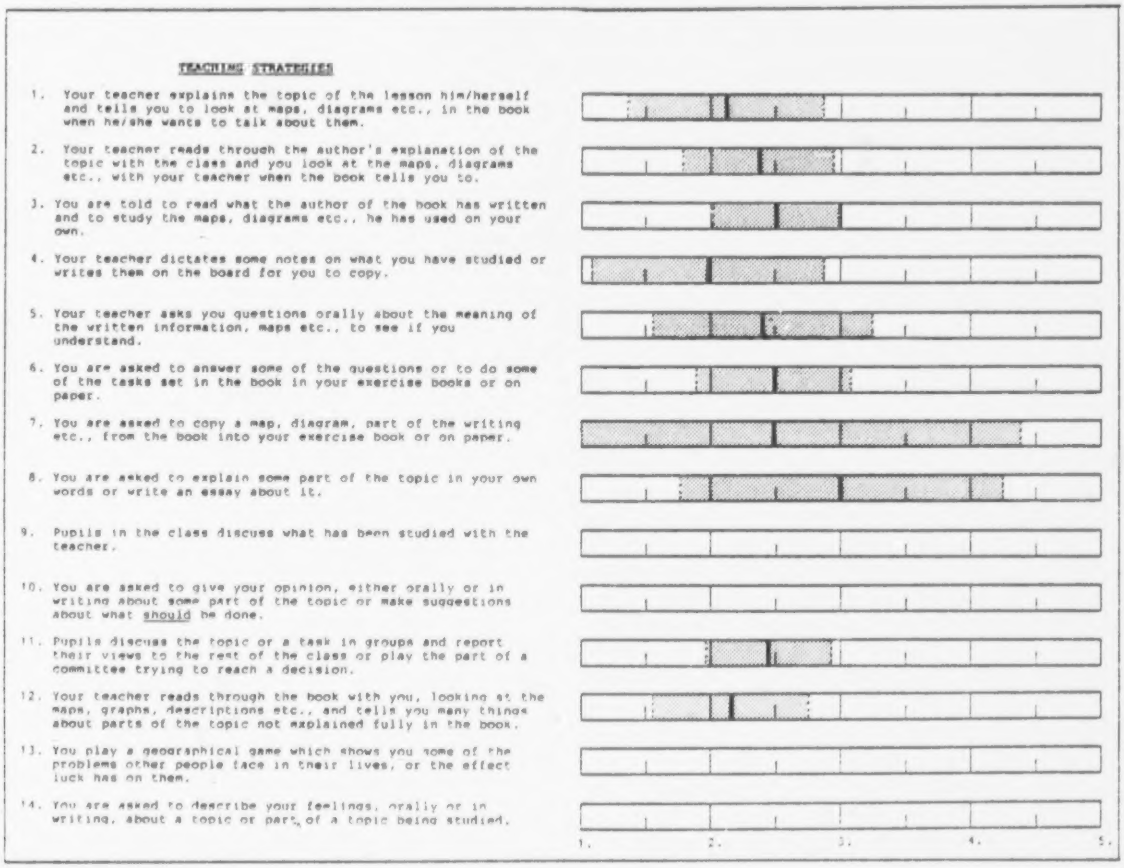


Fig. 21. Pupils' assessment of the six modes of data presentation: Teacher One, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

When asked to evaluate the fourteen teaching strategies which involve the use of text books, pupils of Class 4 denied having experienced strategies 9, 10, 13 and 14, while few could remember strategy 11. All these teaching strategies involve pupil-pupil contact and/or a concern with opinions and values. These pupils expressed their most positive valuations for strategies 1, 4 and 12 all of which involve close teacher supervision of their work. The pupils reserved their lowest valuation for writing their own explanations (8), while reading the books on their own (3), answering text book questions (6), copying (7) and group discussion (11) were also regarded as of relatively low value. This supports the impression of their geography course which has been received from the analysis of the text books and the diaries of Teacher One. Figure 22 summarizes the pupils' responses to the fourteen teaching strategies.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 22. Pupils' assessment of the fourteen teaching strategies Teacher One, Class 4.

(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

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3. SUMMARY OF THE TEACHING STYLE OF TEACHER ONE BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

The analysis of the text books used by Teacher One, his diaries of his lessons with two classes and the responses of his pupils suggests that while text books are of considerable importance to his teaching, there is a considerable emphasis on the teacher using materials from the text books as sources for his own explanations. While many text book questions and activities were used, a greater proportion of open ended questions were selected than might have been expected from their contributions to the books as a whole, while the teacher appears to have provided extra resources in the form of duplicated tables of figures and maps in areas where the books may appear to be deficient.

The high proportion of photographs in the text books do not appear to be used very frequently and are not regarded as being of great value by the pupils. The pupils in both classes appear to regard the text as being of great importance, while the use of statistics is regarded as being of much less value. The impression received by the evidence of the text books, teacher's diaries and pupils' responses is that the content of geography is regarded by the teacher as being of importance, although considerable emphasis is placed on the acquisition of the skills required to work with a variety of data sources. Text books appear to be used whenever possible, with extra resources being supplied to correct deficiencies.

4. THE DISCUSSION-INTERVIEW WITH TEACHER ONE

The teacher explained that the school operated a fairly traditional regional syllabus and that the text books available in the school have been acquired over a number of years. This teacher had played no part in the acquisition of the books. The expectation was that the teacher was given a syllabus for a particular year group and was then expected to find appropriate resources from those available in the school or elsewhere. The teacher stated that the syllabus was written independently of text books, and indicated that, in his opinion, the syllabus should be written independently of text books. He felt that the text books were generally inadequate for the syllabus, although consecutive topics could be taught from the same text book. The teacher regarded text books as providing sources of information for both teacher and pupil and as a resource for pupils to use at an individual level. He did feel that text books played a larger part in the geography curriculum when 'good' text books were available.

The teacher felt that text books available to pupils were the most frequent source of teaching materials, with material copied from other school text books being an important source of diagrams, graphs and tables of statistics. The school had copies of the Geography for the Young School Leaver project materials which were sometimes used while the use of film strips, slides and similar visual materials was prevented by the lack of hardware.

In using the various resources, the teacher felt that he treated all his classes in a similar manner. He emphasized the use of photographs and maps and suggested that pupils were often asked to describe the content of a photograph or a map as an alternative to making notes from the text. The use of tables of figures was also given prominence: 'I tend to be a numerical geographer'. Pupils were often asked to draw their own graphs from tabular material, while written work was often set based on either the pupils' own graphs or graphs provided in the books. In fact, the number of graphs in the text books is not high, but since the pupils often draw their own graphs, they perceive them as being a major component of their geography lessons.

The teacher confirmed that pupils are asked to read aloud in class particularly at the start of a lesson. He believes that this strategy gains the attention of the whole of the class as pupils are happy to follow one person reading. An alternative strategy frequently adopted by this teacher is to talk through the topic with the class before asking pupils to read the author's account for themselves. Once again this strategy stems from a desire to "settle the class down". "I like to draw their attention to what we're about to do, and why we're doing it before launching them into the big wide world. After talking about the topic, then they have a series of tasks which may include reading the text themselves". The teacher also admitted that "it may be a bad habit. I think it was a technique I experienced when I was at school and that's why I instinctively like it. I think teachers often adopt techniques without really questioning them." It would appear that the teacher uses reading around the class primarily as a control strategy, while 'reading for learning' is frequently preceded by some form of teacher introduction, both for the purposes of control and as a type of advance organizer for the pupils (Ausubel, 1960). This does not indicate that the teacher does not regard reading per se as an important part of geography teaching. He stated that "The ability to read to gather information is important as preparation for life". The teacher added that "with lower ability kids there is a limit to how far this can go while still teaching the geography they need for their lives". The teacher suggested that if text books were written at a lower level, then he would encourage the pupils to read more. He expressed the opinion that often lower reading levels meant more juvenile content and very short passages, resulting in pupils rapidly becoming bored. A further problem mentioned was the range of reading abilities present in any given class. It would appear that, for this teacher, the content and skills of geography are of greater importance than the pupils' abilities to extract information from text. Where text can be used with ease, then it is used, but little attempt is made to encourage the use of text as a major contributor to geographic knowledge.

The teacher considered that the use of photographs was an important part of his teaching style. Considering the emphasis placed on photographs by both the main text books available, the photographs were considered to be mediocre both in terms of quality of reproduction and the usefulness of the selection. The teacher considered that their role was to arouse interest as well as to help pupils to form mental images of features or activities being discussed. He said: "I don't tend to give a lesson; I may talk a lot but I don't often stand up in front of the class and teach a lesson. I do like analysing photographs with the class". Where the photograph is closely related to the text, a situation which has been shown to be relatively rare in Beddis's 'Asia', the teacher uses the photograph to help pupils to understand the text. He pondered the possibility of using the text to aid in the understanding of a photograph but suggested that this was a less common usage. This view would seem to be supported by the relatively few occasions on which photographs are discussed at length in the text of the text books. There would seem to be a discrepancy between this view and the strategy commonly adopted by the teacher of analysing a photograph orally with his class. Despite prolonged discussion, it was not possible to resolve this matter. The teacher emphasized the problems of building up a picture in pupils' minds unless either the pupils or the writer are very able. While acknowledging that some writers can evoke pictures in the mind, this teacher did not place the majority of text book writers in this category.

Teaching techniques based on photographs used include drawing sketches from photographs, especially where the text is totally inappropriate to the reading abilities of the pupils. The sketches are usually annotated, either as a summary of a previous class discussion of the photograph, or as an exercise performed by the pupils without the teacher's help. This type of activity is most commonly used with photographs of landscapes or urban scenes. Photographs of people, such as those showing victims of malnutrition or political instability, are usually used to evoke emotion. The teacher suggested that such usage may be 'unfair' in that it may involve the use of emotion to create values and attitudes. He expressed a hope that he used such photographs only to identify values and attitudes but acknowledged that it was equally likely that the effect was to create them. Where such photographs were used, the teacher considered that he would usually use them orally in a directed class discussion. Such discussions would rarely be the essence of the lesson, but would rather be as an introduction to a topic to stimulate interest, before going on to "more formal, more traditionally acceptable geographical tasks". The very low priority given to valuing questions implied by the diaries and the pupils' responses to the various teaching strategies were borne out by this discussion about photographs of people in unfortunate circumstances. The concern for more traditional geographical concerns and formal analysis was emphasized by the reply to a question on the use of photographs as the basis for written homework activities: "Photographs are used for homework, depending on the availability of books, but I don't know if their written descriptions are as good as if I had been there to help them".

The place of maps in geography classes appears to be another area of disparity between theory and practice. In the diary the use of an atlas was rarely mentioned while the teacher stated that Ordnance Survey maps were used only as part of a mapwork course in preparation for external examination mapwork questions. The main use of an atlas appeared to be as a source of specific information to be copied onto a duplicated map outline in preparation for written questions. An enquiry about the importance of maps revealed that a four week unit was about to be initiated with second year pupils on specific locations within the borough, the object being to "improve their mental maps of the borough". Other than this, maps were rarely used at all and when they were used the text book maps were used in preference to the atlas to avoid time spent in distribution and collection. The teacher thought that copying a map from a text book was a task only appropriate for leaving in the absence of the regular teacher, and admitted that the educational value was limited. He said that his teaching of every topic would begin with a map to give "some kind of mental impression of locations" while he also liked to use two maps together so that the class could compare distributions. He stated: "If the kids can remember where places are, that is terrific, but I don't feel that it is the sole reason for studying maps". It appeared that the concept of location is given a very low priority by this teacher, while the use of maps as a geographical skill is taught as a discrete topic. Eliciting relationships from map evidence was described as a significant aim, but represented an activity rarely pursued. The relative paucity of maps in the text books available and the few questions and activities suggested by their authors to encourage the use of maps as tools of geographical enquiry or description in the topics covered seem to be major contributors to this.

Diagrams appear to be little used by the text book authors, nor are they perceived as being a major contributor to the text books by pupils. Nevertheless, all the pupils of this teacher valued the use of diagrams and fourth year pupils perceived them as being of particular significance in their geography course. In view of this, the statement by the teacher that he felt that diagrams were a major part of his teaching strategy is rather surprising. Diagrams were described as being for pupils to copy as a summary of information presented in some other form, but also served as the basis for descriptive writing of processes, being either presented complete or built up on the blackboard by the teacher as part of an expository lesson. It is possible that the emphasis on the descriptive writing may have obscured the pupils' perception of the diagram as being one of the sources of information for the writing.

Graphs and tables were discussed together as representing the main focus of statistical techniques in teaching geography. The skills of drawing and interpreting graphs were regarded as important in their own right, and while it was felt that brighter pupils were capable of such exercises, with younger or less able pupils, activities were structured in such a way as to ensure a technically correct product which would 'give instant impressions before they read the text'. Despite this statement of the importance of graphs Poxon and Poxon was criticised for including completed graphs: "I prefer to encourage pupils to draw their own graphs at every opportunity".

The fairly narrow range of responses to the various modes of data presentation (Figures 14 and 20) suggests that all are used with similar frequency. The teacher noted this in the Figures and commented "I tend to set exercises rather than stand there and talk. I want the kids to turn to data for information. I run around the class helping individual kids."

When the teacher was asked to rank the fourteen teaching strategies which had been presented to the pupils in terms of their importance in his own teaching style, he rejected only that in which pupils discuss a topic in groups (11). He ranked class discussion (9) as his major teaching strategy followed by copying (7), text book questions (6) and oral questioning by the teacher (5) The use of text books by the pupils unassisted (3), work involving feelings (14), geographical games (13) and pupils opinions (10) were placed low in his ranking. When these rankings were correlated with those of his pupils using the Spearman rank Correlation Coefficient technique, no correlation was found. (R = 0.2 with Class 3 and 0.12 with Class 4, although this rose to O.67 when those strategies which either teacher or class denied having been used were removed from the calculation. A value for R of 0.7 or greater is conventionally required for a correlation between two rankings to be accepted).

In discussing the pupils' responses to the strategies, the teacher commented "My practice is at variance with my philosophy of education. I tend to teach in a very whole-class oriented way. My shortcoming as a teacher is a lack of imagination. I tend to stick to concrete activities which I know will work. I do a lot of individual work with kids even though that doesn't show up in the survey. Even then, I am more teacher-oriented than I need be." When asked about the use of group discussions, games and pupils own feelings about topics, he replied: "That fourth year were a difficult class and so discussion was difficult. I did the "Desert Survival Game" with the third years - they're the only ones who've played a game this year. I don't tend to ask the kids their opinions much, I don't know why."

The teacher was asked about his use of the text book questions and activities. He emphasised that although he used them a lot, he only selected those that he knew the pupils would be able to complete. He added that even after such selection, he still had to explain the activities to groups of pupils individually: "The first question they ask is usually 'What does the question mean?'" Teacher One stated that he would like text books to include a greater variety of activities: "I want a variety - comprehension exercises, graphical work, table interpretation, skills like that. Why can't they include specimen answers of how geographical descriptions should be written? I've never seen this in geography but maths books do it all the time. We are into enquiry learning, why can't the kids enquire into their own answers and compare their answers with those of the experts? We should allow the kids to indulge in self-assessment. That is difficult if they can only compare their work with the teacher's ideas."

Teacher One considered that text books exerted a great influence on styles of geography teaching: "With an average teacher in an average teaching situation, a text book is essential. With endless time, any teacher will broaden his teaching strategies, but given the fact that most of us rush our preparation for 80% of our lessons, and only prepare a few really well, then the text book controls what we teach". Similarly the public examination system was seen to control the teaching: "Exams control content in particular. The exam questions ask kids to 'Comment on three of the following: stacks, arches ...' that is fact, so they need to know it." Despite this, the teacher insisted that the acquisition of skills of data interpretation were far more important than factual knowledge: "after all, that is all you can transfer to new situations".

Within the constraints of text books, individual classes and external examination syllabuses, Teacher One insisted that his role was firstly, to assist his pupils to gain critical and analytical skills and, secondly, to gain specific knowledge of geographical topics which, in his opinion, all citizens should know.

II. TEACHER TWO

Teacher Two was a trained graduate with four years' classroom experience at the time of the study. She was teaching at a medium sized comprehensive school in which the relative proportions of pupils of varying abilities was controlled by the local authority. Pupils were placed in one of two bands according to ability on entry to the school, but were taught in mixed ability groups within their band until the fourth year when groups were formed in each subject according to their public examination aspiration.

The teacher agreed to keep a diary of her lessons with two classes: a first year class from the upper band and a fourth year class preparing for the Certificate of Secondary Education.

1. CLASS 1

A. Text book analysis and readability

With Class 1, Teacher Two used two volumes from the Macdonald Colour Unit series, South East England and Farming and Fishing. These books are intended for use by fourth and fifth year pupils preparing for public examinations. Figures 23a and 23b summarize the analyses of these books.

SUMMARY ANALYSIS OF BOOK 35: M.C.U. South East England

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	42	20	14	21	0	3	58
Textual references to illustrations: None:	-	86	100	80	-	100	88
In passing:	-	0	0	0	-	0	0
Detailed:	-	14	0	20	-	0	12
Percentage of illustrations used in Questions/Activities	-	14	67	20	-	0	25

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 18

		Non-experiential	Experiential
Percentage of all Questions/Activities		57	43
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	38	83
	Integrating	63	0
	Open ended	0	17
	Valuing	0	0

Fig. 23a.

SUMMARY ANALYSIS OF BOOK 37: M.C.U. Farming and Fishing in Britain

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	48	35	1	8	1	7	52
Textual references to illustrations: None:	-	91	50	100	100	50	76
In passing:	-	0	50	0	0	50	19
Detailed:	-	9	0	0	0	0	5
Percentage of illustrations used in Questions/Activities	-	9	50	67	100	50	33

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 10

		Non-experiential	Experiential
Percentage of all Questions/Activities		61	39
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	14	56
	Integrating	50	44
	Open ended	36	0
	Valuing	0	0

Fig. 23b

Fig. 23. Summaries of the analyses of the text books used by Teacher Two with Class 1

Figures 23a and 23b show that both books have a predominance of illustrations over text and that both include large areas of photographs. About one third of the total print area of South East England is devoted to maps and diagrams, substantially more than in Farming and Fishing. In both books, the majority of the illustrations are presented without reference in the text, and detailed explanation of illustrations is rare. Between a quarter and a third of the illustrations are used for pupil activities.

The proportions of questions and activities in both books are relatively small, and the majority of the questions and activities are non-experiential. While most non-experiential questions and activities require pupils to integrate existing knowledge into the topic under study, the majority of experiential questions and activities require confirmation.

Appendix I suggests that these books have readability levels which are too high for first year pupils with a mean chronological age of 11.11 years. The results of an eighty deletion cloze test on Farming and Fishing (Figure 24) showed that the class mean score was 50%, suggesting that the book is appropriate for class use at the instructional level.

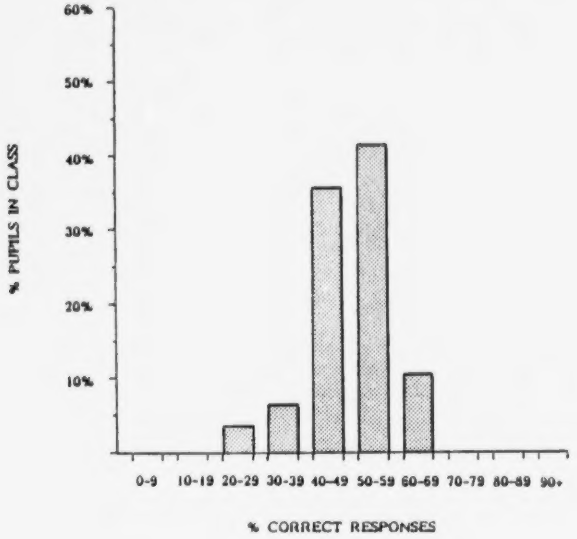


Fig. 24. The results of a cloze test on Book 37: Farming and Fishing with Class 1 of Teacher Two. Pupil N = 28; Deletion N = 80; Mean = 50%

B. Record of lessons

a) The written diary

Figure 25 is a summary of the diary of the lessons with Class One. It shows that the lessons relied heavily on two text books. Pupils only studied the books alone after the teacher had given an exposition on the topic, while only diagrams or tables were copied. The teacher made little use of the questions and activities suggested by the authors and those initiated by the teacher herself mainly took the form of confirming factual detail or involved the integration of some principle. One lesson was devoted to more open ended oral activity in which values were explored when the class engaged in a formal debate on the motion that "This house regards factory farming as a necessary evil".

SUMMARY OF DIARY OF TEACHER 2 :CLASS 1 :N.= 30

Volume of text book usage: No. of sessions recorded:9 (18 school periods)
No. of sessions in which text books used: 8 : 89 %

Text books used during period of diary (and no. of sessions used):
No. 35: M.C.U. S.E.England (1) No. 37: M.C.U. Farming and Fishing (7)

Of the 8 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 1 (12%); made reference to elements of tb: 2 (25%);
used tb as basis for exposition: 2 (25%); taught entirely from tb: 3 (38%);

No. of sessions in which elements received particular reference:
Text: 2 ; Photo: 1 ; Map: 1 ; Diagram: 2 ; Graph: 0 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 4 sessions.
Of these, all were after teacher explanation.
Pupils copied information from the text book during 4 sessions as follows:
Text: 0 Photo: 0 Map: 1 Diagram: 3 Graph: 0 Table: 1

Pupils' completion of Questions/Activities
There were a total of 18 Q/As. Of these 100% were Non-exper'l; 0% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
2(6%) orally; 16 (94%) in writing (15 (84%) of which were teacher-initiated)
The oral activity included a teacher initiated formal debate.

The origins of Q/As were as follows (no. of references):
Bk 35: 2 (6%); Bk 37: 1 (3%);

Non-experiential questions (N = 18):
Rhetorical: 0%; Confirming: 66%; Integrating: 28%; Open Ended: 0%;Valuing: 6%

Experiential questions (N = 0):

Fig. 25

This teacher made an audio tape of one of her lessons with Class One. The 35 minute lesson was conducted entirely orally and was concerned with the functions of London. The pupils had copies of the Macdonald Colour Unit on London opened at a map of central London and a photograph of the Tower. During the course of the lesson, the teacher asked a total of 60 discrete questions, excluding those which were re-phrased for the purposes of clarification. Most of these questions were non-experiential, and of these the majority involved confirmation. Of those questions which were open-ended, many only required the pupils to select the order in which topics were explored; for example "What might the next thing be that an American tourist in London would want to see?" Similarly, two-thirds of the experiential questions were confirming, of which the majority required communicating skills and the remainder involved the observation or organization of information. The open ended questions asked pupils what they noticed about elements of the photograph or the map.

C. Pupil responses

Figure 26 summarizes Class One pupils' perceptions of the relative importance of the various modes of data presentation in Farming and Fishing. These pupils perceived the book as placing particular emphasis on text, photographs and diagrams, with graphs and tables being less frequent.

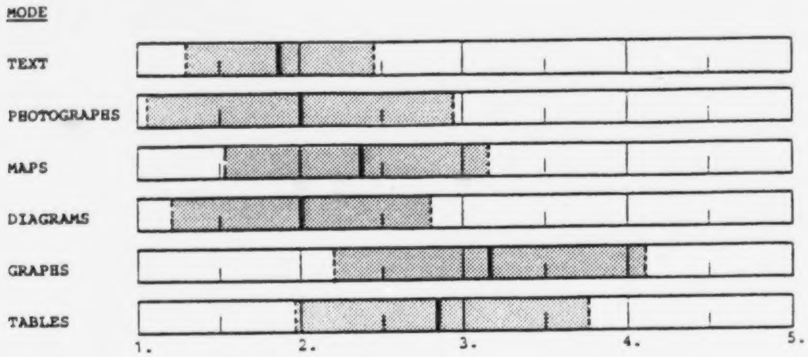


Fig. 26. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 37 by the pupils of Teacher Two, Class 1. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

The pupils' perceptions of the relative frequency with which they encountered each of the modes of data presentation in their geography lessons (shown in Figure 27) revealed that the text was seen as of paramount importance, followed by diagrams. The photographs, while being perceived as occupying a large proportion of the book, were seen as being used little in their geography classes.

When asked to assess the importance of the various modes, (Figure 28) the pupils rated diagrams and maps most highly, with the text third in value. Photographs, graphs and tables of figures were less highly valued.

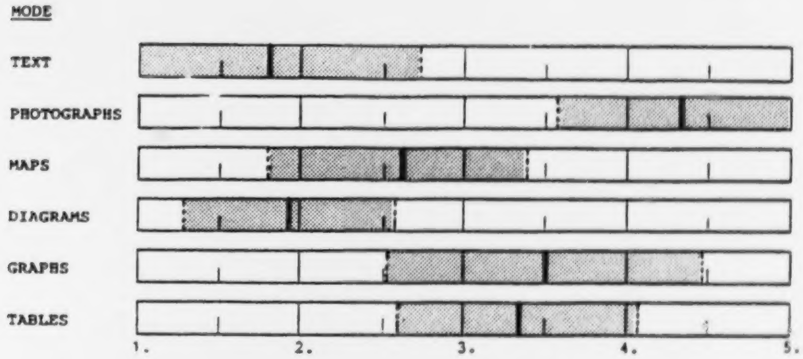


Fig. 27. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Two, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

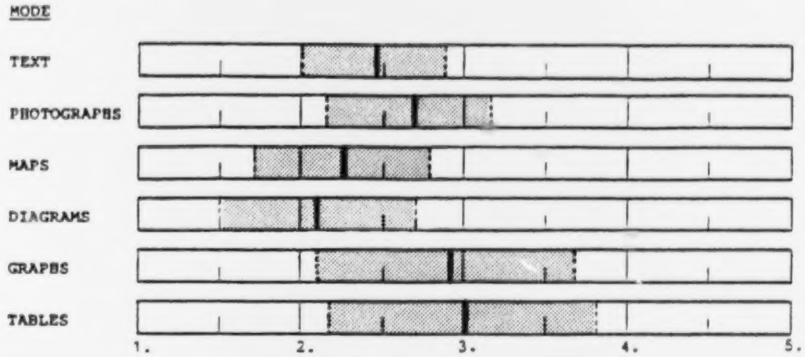
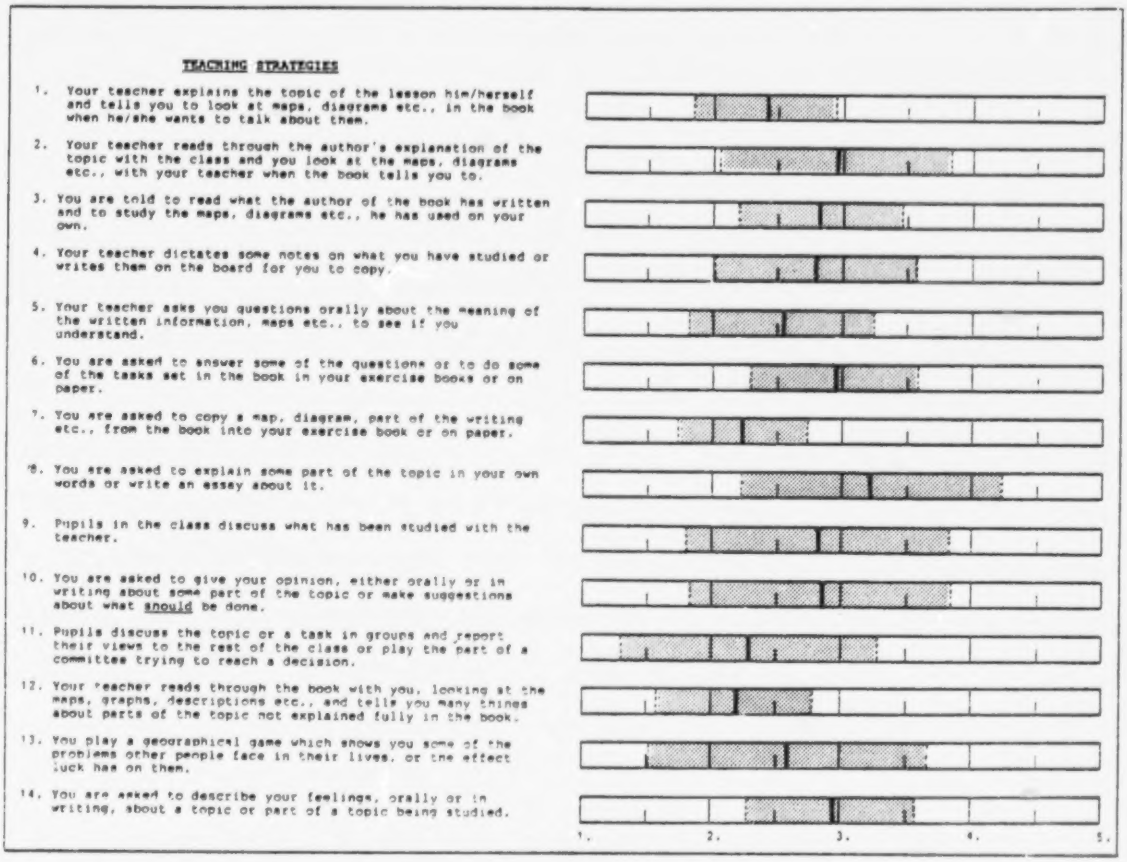


Fig. 28. Pupils' assessment of the six modes of data presentation: Teacher Two, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 29 summarizes the assessment of Class 1 of the fourteen teaching strategies presented. From this evidence, the pupils valued most highly those lessons where the teacher read through the book with them (12), where they copied information from the text book (7), and where the teacher explained the topic herself (1) although group discussion (11) also rated highly. These pupils rated as of least value those strategies where they were asked to follow the text book as their teacher read it to them (2), describe their feelings (14) and write an account (8). However, with the exception of strategy 8, these pupils appeared to value all the strategies.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 29. Pupils' assessment of the fourteen teaching strategies: Teacher Two, Class 1. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS FOUR

A. Analysis and readability of the text books

With Class Four, Teacher Two used four text books during the period of her diary. These were South East England and London (Macdonald Colour Units, Books 35 and 36), The British Isles (Young and Lowry, Book 56) and Oxford Geography Project 3 (Grenyer et al., Book 22). Figures 30a, 30b, 30c, and 30d summarize the analyses of these books. The analyses show that all the books devote most of their print area to illustrations. Of the modes of graphic illustration, photographs predominate in Young and Lowry, maps predominate in London, diagrams predominate in South East England and photographs and maps are of equal dominance in Grenyer et al. In neither of the Macdonald Colour Units are a large proportion of the illustrations discussed in detail in the text, while Young and Lowry discuss about a third of their illustrations and Grenyer et al., rather more. Similarly, the Colour Units use relatively few of their illustrations as bases for questions and activities, while over half of the illustrations in Grenyer et al. are used in this way. Grenyer et al. is the only book of those used with Class 4 in which over a quarter of the text is devoted to questions and activities. In all the books except South East England the majority of the questions and activities are experiential, with a predominance of integrating questions in Grenyer et al. and Young and Lowry, and confirming questions in the two Colour Units. Of the non-experiential questions and activities, London and Grenyer et al. have a high proportion of open-ended questions; South East England includes a high proportion of integrating questions and Young and Lowry includes equal proportions of confirming and integrating questions.

With the exception of Grenyer et al., which is intended for third year pupils, the other three books are all written for fourth and fifth year pupils. Appendix I shows that the books all have readability levels of 15 or 16 years, and are therefore likely to be appropriate for fourth year pupils of mean age 14.11. This is confirmed by the results of the cloze tests which were administered on both the Colour Units. The mean scores show that the class as a whole can work with both books at the independent level, while Figures 31a and 31b show that no pupil scored less than 40%, confirming that no pupils would be working at frustration level.

In summary, the combination of these four books appears to offer teacher and class a high degree of access to all the modes of data presentation with the possible exceptions of graphs and tables of figures. Many of the illustrations are presented without textual help in their interpretation, and relatively few are used as the basis for questions and activities. Only one book includes a high proportion of questions and activities, but the books taken together appear to offer a wide range of questions and activities. The books would all appear to be within the readability levels of the pupils in the class.

SUMMARY ANALYSIS OF BOOK 35: M.C.U. South East England

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	42	20	14	21	0	3	58
Textual references to illustrations: None:	-	86	100	80	-	100	88
In passing:	-	0	0	0	-	0	0
Detailed:	-	14	0	20	-	0	12
Percentage of illustrations used in Questions/Activities	-	14	67	20	-	0	25

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 18

	Non-experiential	Experiential
Percentage of all Questions/Activities	57	43
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	38	83
Integrating	63	0
Open ended	0	17
Valuing	0	0

Fig. 30a

SUMMARY ANALYSIS OF BOOK 36: M.C.U. London

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	26	26	35	9	0	4	74
Textual references to illustrations: None:	-	100	80	100	-	0	82
In passing:	-	0	20	0	-	33	9
Detailed:	-	0	0	0	-	67	9
Percentage of illustrations used in Questions/Activities	-	0	60	100	-	100	36

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	21	79
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	33	55
Integrating	0	45
Open ended	67	0
Valuing	0	0

Fig. 30b

SUMMARY ANALYSIS OF BOOK 56: Young and Lowry The British Isles

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	24	16	6	1	8	56
Textual references to illustrations: None:	-	25	47	33	0	63	40
In passing:	-	44	11	67	0	38	30
Detailed:	-	31	42	0	100	0	30
Percentage of illustrations used in Questions/Activities	-	25	58	67	0	50	45

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 21

	Non-experiential	Experiential
Percentage of all Questions/Activities	29	71
Percentage of each type of Question/Activity		
Rhetorical	19	-
Confirming	38	33
Integrating	38	59
Open ended	6	8
Valuing	0	0

Fig. 30c

SUMMARY ANALYSIS OF BOOK 22: Grenyer et al. Oxford Geography Project 3

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	24	24	6	1	7	61
Textual references to illustrations: None:	-	46	38	25	0	43	40
In passing:	-	8	0	50	0	43	18
Detailed:	-	46	63	25	100	14	42
Percentage of illustrations used in Questions/Activities	-	46	88	50	100	100	58

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 41

	Non-experiential	Experiential
Percentage of all Questions/Activities	30	70
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	19	38
Integrating	50	57
Open ended	31	5
Valuing	0	0

Fig. 30d

Fig. 30. Summaries of the analyses of the text books used by Teacher Two with Class 4

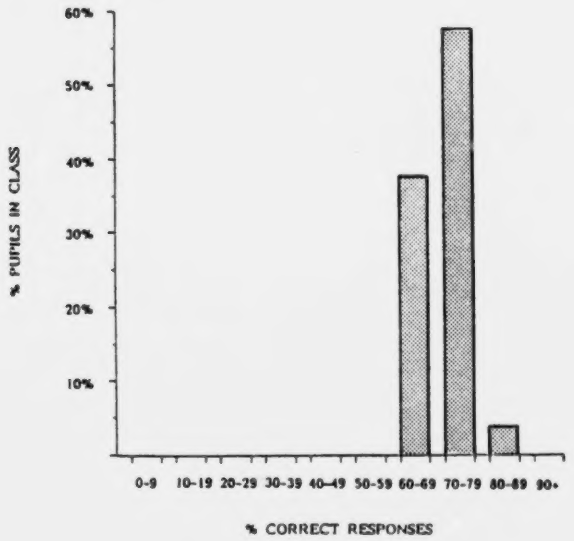


Fig. 31a. **The results of a cloze test on Book 35: South East England with Class 4 of Teacher Two. Pupil N = 24; Deletion N = 80; Mean = 72%**

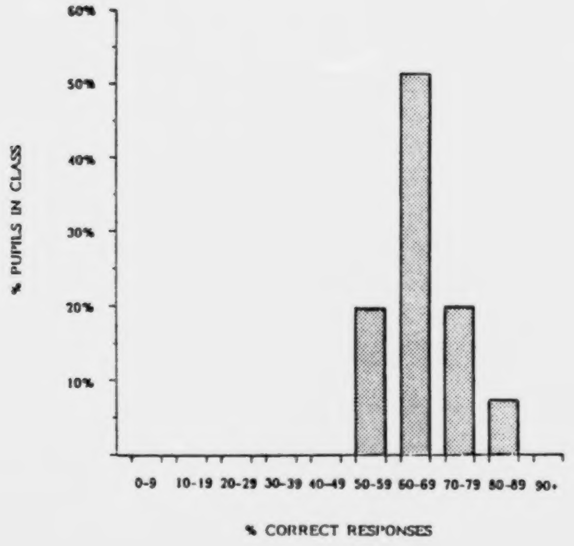


Fig. 31b. **The results of a cloze test on Book 36: London with Class 4 of Teacher Two. Pupil N = 25; Deletion N = 81; Mean = 66%**

B. Record of lessons

a) The written diary

Figure 32 summarizes Teacher Two's diary of her lessons with Class 4.

SUMMARY OF DIARY OF TEACHER 2 :CLASS 4 :N.= 21

Volume of text book usage: No. of sessions recorded:17 (34 school periods)
No. of sessions in which text books used: 15 : 88%

Text books used during period of diary (and no. of sessions used):
No. 35: M.C.U. S.E. England (6) No. 56: Young & Lowry; The British Isles (2)
No. 22: Grenyer; Oxford Geography Project 3(2) No. 36: M.C.U. London (6)

Of the 15 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 5 (33%); made reference to elements of tb: 4 (27%);
used tb as basis for exposition: 6 (40%); taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text: 4 ; Photo: 3 ; Map: 4 ; Diagram: 3; Graph: 0 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 11 sessions.
Of these all were after teacher explanation.

Pupils copied information from the text book during 8 sessions as follows:
Text: 1 Photo: 0 Map: 7 Diagram: 0 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There was a total of 40 Q/As. Of these 87.5%were Non-exper'l;12.5% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
0 (0%) orally; 40 (100%) in writing; all of which were teacher-initiated

Non-experiential questions (N = 35):
Rhetorical: 0%; Confirming:72%; Integrating: 28%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 5):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	40	0	0	0	40
Comparing	0	0	0	0	0
Organizing	20	20	0	0	40
Experimenting	0	0	0	0	0
Inferring	0	0	0	0	0
Applying	20	0	0	0	20
TOTAL %	80	20	0	0	100

Experiential Q/As referred to data sources as follows (% references, N= 5):
Atlas: 0%; Other text: 0%; Photo: 20%; Map: 80%;
Diagram: 0%; Graph: 0%; Table: 0%

Origin of data sources referred to in Experiential Q/As:

%	Bk35	Bk36	Bk22	Bk56	Other
Photo	5	5	5	5	0
Map	0	80	0	0	0
Diag	0	0	0	0	0
Graph	0	0	0	0	0
Table	0	0	0	0	0
TOTAL %	5	85	5	5	0

Fig. 32

Despite the relatively high text book usage (88% of lessons recorded), the teacher made either no reference to the book in the majority of her expositions or referred to discrete elements of the text. In the remaining lessons, the teacher used the text book account as the basis for her own exposition, but on no occasion did she teach entirely from the text book. When pupils studied a book on their own it was always after a teacher exposition on the topic. Copying from a book, when it occurred, was almost always of maps.

The teacher made no use of any of the questions or activities suggested by the authors of the books she used, and most of the questions and activities she herself initiated were non- experiential involving confirmation and integration. A similar pattern emerged from analysis of the questions and activities which were categorized as experiential and based on maps and a photograph. In all these cases, the data on which the work was based came from one or other of the text books. Open ended questions and questions involving values received no mention at all.

b) Audio recording of lessons

In an audio-recorded lesson, the Macdonald Colour Unit on South West England was available to the pupils and the lesson proceeded with selected pupils reading passages from the book aloud, whereupon the teacher would either explain the passage further or ask the class questions based upon the passage. Again, most of the 21 questions were non-experiential while about a third (31%) of the questions were categorized as rhetorical: the teacher did not wait for or invite a pupil response as in, for example: "Have you all had kaolin and morphine? You have probably all had it at some time or another when you have had an upset stomach." The text book passage studied during the lesson included a map, a table, two graphs and a photograph, all concerned with mining and quarrying in Cornwall. While the teacher did ask a number of experiential questions, most of which were confirming, about a third (38%) were open ended and required pupils to draw inferences from the tables of figures.

The overriding aim of this teacher would seem, from the evidence of the diaries and audio recordings, to have been to teach factual information and to ensure that the pupils had a detailed written summary of the subject matter covered. There would seem to have been little attempt to teach the skills of geography or for pupils to engage in any form of enquiry learning, despite the considerable possibilities for such practice offered by the text books available. The various illustrations available in the text books were used primarily in oral lessons to illustrate the teacher's exposition of the topic, while oral questioning was designed to ascertain the pupils' existing state of factual knowledge. At fourth year level, it appeared that some attention was paid orally to the interpretation and analysis of graphs and tables of figures.

The questions and activities presented in the books were rarely, if ever, used with any class and those initiated by the teacher placed great emphasis on the recording of factual information. Open ended or valuing questions and activities did not feature in the lessons recorded in the diary, with the exception of the debate with first year pupils, while the role of open ended questions in oral lessons seemed to be largely limited to pupils prompting the teacher on the order in which her exposition should be presented. Most written work consisted of 'writing up' the content of the lesson.

C. Pupils' responses to their books and diaries

Figure 33 summarizes the pupils' perceptions of the use of the various presentation modes in the Macdonald Colour Unit on London (Book 36). (In administering the pupil questionaire, the teacher instructed the class to comment only on the text book currently in use). It shows that these pupils saw the maps as being of greatest significance, followed by text and diagrams. In their own geography lessons (Figure 34) they perceived diagrams, maps and text to be of greatest significance, with photographs being used least of all the modes. Once again, this contrasts with their assessment of the value of the various modes (Figure 35) insofar as they regarded diagrams and maps to be of greatest value, followed by photographs and text.

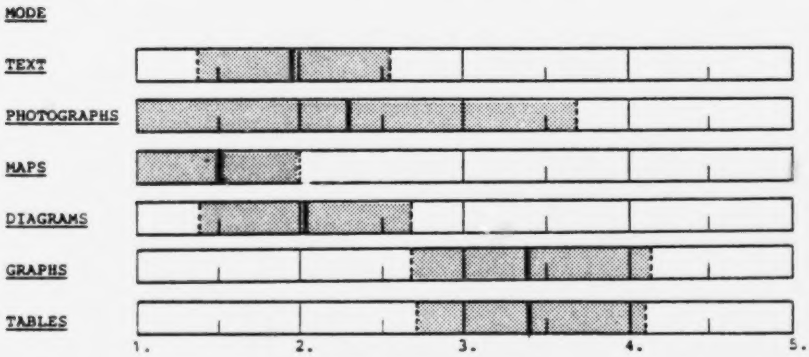


Fig. 33. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 36 by the pupils of Teacher Two, Class 4. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

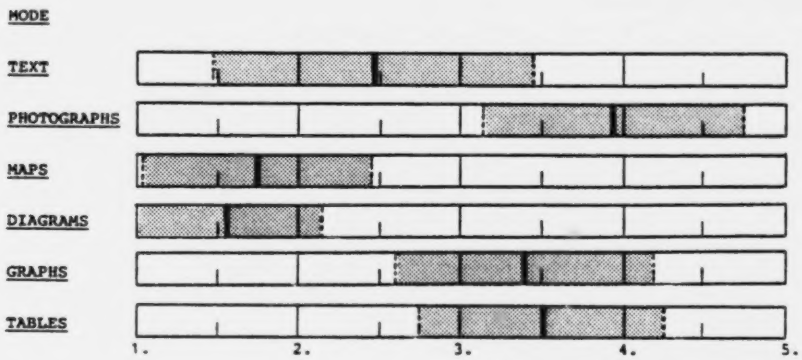


Fig. 34. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Two, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

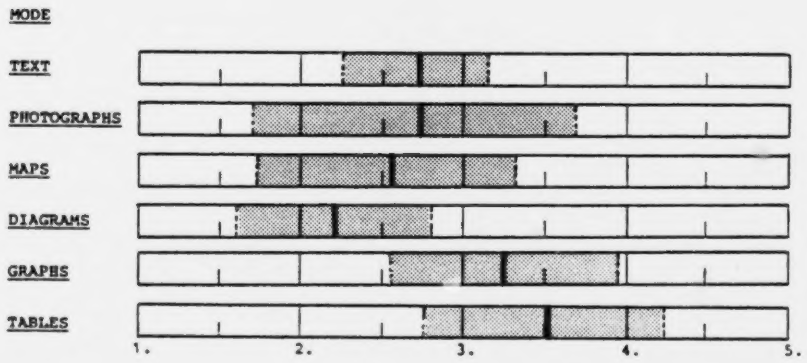
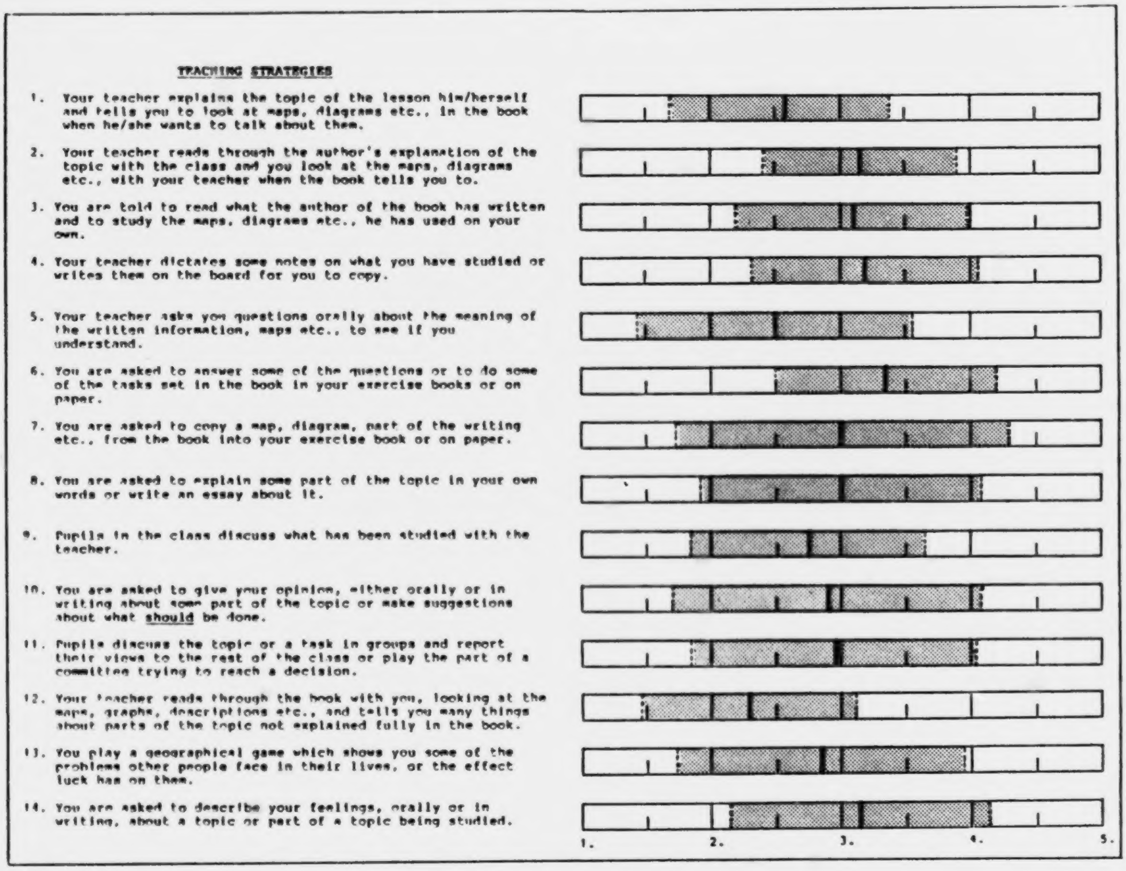


Fig. 35. Pupils' assessment of the six modes of data presentation: Teacher Two, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 36 summarizes Class Four's assessment of the teaching strategies. These pupils placed most value on teacher explanation (1 and 12), teacher oral questioning (5) and class discussion (9). Writing descriptions, whether of feelings (14) or from dictation (4), studying the book alone (3) or answering questions from the text book (6) were amongst the least valued questions.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 36. Pupils' assessment of the fourteen teaching strategies
Teacher Two, Class 4.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER TWO BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Taking the classes together, pupils of Teacher Two appeared to be aware of the range of presentation modes available in the text books which they were using, while perceiving that in their geography lessons, maps and diagrams were of greater significance, and photographs and text of less significance, than might have been expected from the text books themselves. The pupils' own assessment of the value of the various modes revealed that while their regard for maps and diagrams was reflected in their perceptions of their geography lessons, they valued photographs more highly and text less than the emphasis in their lessons would have suggested.

These pupils appeared to value most highly those teaching strategies which placed them in close contact with the teacher. These included teacher questioning (5), teacher explanation of the book (12) and class discussion with the teacher (9). They also valued playing geographical games and copying information (7), although enthusiasm for this activity diminished with age. Least valued were strategies which were closely tied to the text book. These included the teacher reading through the book with the class (2), pupils reading a book on their own (3) and answering text book questions (6). Describing their feelings was not valued highly by most pupils.

4. THE DISCUSSION-INTERVIEW WITH TEACHER TWO

The topics to be taught in this school were prescribed by the Head of Department in the school geography syllabus. Within the constraints of the list of topics, individual teachers were at liberty to select resources from whichever sources were available. In describing how she selected resources, this teacher acknowledged the assumption of whole class teaching methods based on teacher exposition, in which the text book had the primary function of providing illustrative material to support the teacher's explanation of the topic. Film strips, slides, video presentations and films were also used as sources of information, and, as with the teacher exposition, pupils recorded the content by 'making notes'. The teacher explained that practical and administrative problems resulted in such audio-visual aids being used relatively rarely and text books being the main source of teaching resources.

The teacher agreed with the pupils' perceptions that written text, diagrams and maps were the main resources used, with photographs being used but rarely. She explained that "I am much happier teaching with clear cut diagrams and text which can be explained rather than looking at a photograph which will require a lot more explanation to get anything from it." With older pupils in the fourth year, preparing for public examinations, even written text was used rarely as "the information is mainly in the teacher's head with maps and diagrams from books to back it up". The preference for diagrams was expressed particularly strongly in the context of physical geography. "In the fourth year course pressure of time makes diagrams preferable, although each topic is finished by the examination of photographs to show how actual features such as roches moutonnees are different from the ideal roche moutonnee". The teacher was asked whether she personally liked teaching the topics in this way. She replied that time pressure was strong throughout the school and with a full course to teach, a tight structure was needed. The pressure came from the Head of Department who wrote the syllabus and also set the examinations for each class in the lower school. "There is little time in a rush-rush school like ours to think about change". Later in the conversation, the influence of the syllabus was re-introduced. At that time the teacher repeated that in a highly competitive school, in which band placements were decided and confirmed by examination results, the teacher has a duty to protect her pupils' position within the school, while at the same time helping those in the lower band to improve and earn a place in the upper band. The teacher was also conscious of the importance of her pupils performing well, on her own reputation. On returning to the question as to whether the teacher actually liked a crowded syllabus, she replied that she enjoyed covering a lot of material. "There are a lot of things on the syllabus which are very interesting. I enjoy teaching them and I assume that my pupils enjoy learning about them. To do anything slowly in great detail would be very boring."

The teacher explained that while she considered it important for pupils to learn to comprehend information provided in a written form, it was not something which received much emphasis. This teacher always required pupils to read from the text book as a follow up to her own verbal explanation. The reasons for this were ascribed firstly to the importance of the teacher creating an appropriate structure to help the pupils to understand the topic. Secondly, since pupils found difficulty in learning from text books, it was important for the teacher to create a structure to aid the pupils in their reading. The teacher regarded the presentation of the structure as of more importance than helping pupils in their reading. She stated that "if there is a teacher in the room, then verbal explanation is the most important teaching strategy. A teacher communicates more effectively than a book". Furthermore, this teacher did not consider that she would change her style of teaching even if books of a lower readability level were available since she thought that every teacher had her own ideas as to the way a topic should be structured; the teacher's job was to present her own structure to her own pupils. She added that "a lesson in which pupils study a book alone should be reserved for when the teacher is tired. It is a lazy way of teaching".

For this teacher, the long term aim of explanatory lessons was to help pupils become independent readers, able to extract information from their books, but she felt that they needed much help in achieving this. She stated that her pupils rarely had any difficulty in using text books for assignment or revision purposes after she had presented them with an appropriate structure to the topic. This view seems to be borne out by the results of the cloze tests presented in Figures 42, 49 and 56 a and 56b above. The teacher did regard library skills such as search techniques as important but stated that these were generally reserved for homework assignments.

The teacher admitted that while she considered that photographs were important in geography teaching they did not feature in her teaching as much as she would wish. She considered that photographs in text books were inferior due to their size and the difficulties of ensuring that all pupils were observing the relevant aspects of the picture. This, she felt, resulted in a loss of concentration for her pupils.

Photographs were generally used during oral lessons when they could be described by the teacher. At fourth year level in particular, photographs were used to demonstrate the field evidence for features which had been described in ideal form using diagrams. Thus the main use of photographs for this teacher was illustrative. The photographs in the Macdonald Colour Units which are overprinted with labels were regarded as particularly effective in providing illustrative materials for the teacher's exposition. Some simple landscape photographs were used to give pupils practice in landscape sketching. In most cases the teacher regarded photographs to require too much background knowledge for accurate interpretation by pupils.

The teacher explained that the school geography syllabus prescribed the study of Ordnance Survey map skills for first year pupils and atlas skills for second year pupils, but added that in these two courses, it was the skills and not their applications which received attention. Interpretation of the information on maps was left until the fourth and fifth years when the requirements of the public examinations were paramount. Atlas and Ordnance Survey maps were rarely if ever used other than to teach the skills of their use in isolation. Even with the older pupils, the teacher regarded atlas maps as of too great complexity to merit their use. The examination course did not permit the time to extract the relevant information from atlas maps.

On the other hand, the sketch maps and thematic maps presented in the text books were regarded as important components of the teaching strategies adopted. They were regarded as useful, firstly, to illustrate patterns or locations already described by the teacher, and secondly, as resources for oral use in class.

Diagrams of all sorts were regarded as being of great importance. In particular she used them to aid her own explanations of patterns and processes in the topics she was teaching, although they were also used for description, explanation and summarization. Appropriate diagrams were the main reason for the selection of a particular text book. The teacher's emphasis on diagrams was echoed by the responses of both her classes.

While the teacher stated that one of her aims in teaching was to help pupils to use graphs and tables of figures on their own, she admitted that their use in class was usually to illustrate trends which had been explained in advance. While stating that "our courses involve more observing than thinking" she claimed that when graphs and tables were used orally with the class, pupils were led towards the ability to interpret statistics on their own. The teacher only used statistics when they were encountered in one or other of the text books being used. "I am a teacher faced with a class and a syllabus. Pressure on time ensures that I only use the resources which are available". The skills of graph drawing were regarded as important and were constantly revised throughout the five year geography course.

The teacher was asked to rank the fourteen teaching strategies which had been presented to the pupils for valuation on the basis of her own perception of their importance. Spearman's Rank Coefficient Correlation technique revealed that there was no correlation between the strategies which the teacher considered to be most important in the classroom and those which were deemed most valuable by her pupils (With Class One, R=0.13; with Class Four, R=0.28. NB. An R of +/- 0.7 is generally taken as indicating a measurable correlation between two rankings). On the other hand, the rank order of strategies which the teacher revealed as being of greatest importance was not borne out by either the diaries of the two classes nor the conversations on the uses of text book materials which have been summarized above. The teacher considered that strategies in which pupils may express their own opinions and discuss various elements with the teacher were of particular importance (10, 9, 14 were ranked as the first three), while her pupils placed much less value on such strategies compared with those in which they had close contact with the teacher (1,2,5,9 and 10). This diversity between what the teacher considered important and what the pupils valued most highly was explained by the teacher in terms of the pressure to succeed competitively created by the school's banding and examination system. The evidence collected would suggest that despite the beliefs expressed by this teacher of the importance of more liberal strategies, the pattern of lessons revealed in the diaries and the audio-recorded lessons, the written work set and the teacher's own definition of the aims of her lessons had done much to foster the pupils' attitudes. In a final summing up of her attitude to the teaching strategies, the teacher made the criticism that the list of possible strategies did not include straight lecturing. This was felt to be particularly relevant when a new topic was being introduced: "You cannot ask pupils what a roche moutonnée is until they have been told".

The responses to strategies which involved text book questions and activities: "boring for the pupils, they have nothing to pace themselves against"; group discussions: "time consuming and the teacher has to be in ten different places at once to direct the discussion"; and games and the exploration of values and attitudes: "are not important for the examinations but are fun to play after the examinations in the summer term" all illustrate the emphasis placed on the acquisition of factual knowledge within the school and the reliance on teacher-controlled learning. Nevertheless, all the pupils recorded some experience of all the teaching strategies presented for their judgement, and positive reactions to almost all of them.

The teacher was asked whether her attitude to text books would change if a text book written specifically for that school's syllabus could be found. The answer was firmly in the negative: "I would get bored. I think of teaching as being a person, an individual, explaining something to pupils with the aid of resources. I cannot imagine teaching from a course text. Where would be the place for new inspiration, moods and new knowledge to come through in the teaching?" What of the role of questions and activities in a text book? "They are useful to jog the teacher's memory about what uses could be made of the various resources, but really I prefer to make up my own." In summing up the ideal text book for her classes, the teacher described the good text book as having good photographs, maps and diagrams, clear, concise and relevant to the topic. These would provide reference points on which the teacher might build. It would have brief written descriptions as a summary both to remind the teacher and for pupils to use for their own note making. A text book should have a good glossary to help pupils in the absence of the teacher. Given the basic content of a topic in the text book, the teacher may help her pupils to interpret the facts in a number of ways. She should interact with her pupils and the information in the book. In so doing, the pupils would have the opportunity to learn how to apply the skills of geography on the information provided if they so wished, but the essence of the teaching style would be to teach pupils the answers to specific problems. Having learned with the teacher how to approach one set of problems they should be able to apply similar techniques to other similar problems.

The conversation with this teacher suggested that the text book as such was of only minor importance in the geography curriculum presented to these pupils. Although the books available ranged from the relatively new to the somewhat dated, their use and influence on the curriculum was merely that of an anthology of maps and diagrams to be updated whenever necessary by the teacher's personal knowledge of the topics being taught. That pupils appeared to experience a wide range of teaching strategies despite the predominance of teacher exposition, and placed particularly high valuations on those strategies which kept them in close proximity to the teacher's guidance suggested that the pressure placed on these pupils by the school and examination systems was mitigated by the knowledge and charisma of the teacher.

III. TEACHER THREE

Teacher Three was in her fourth year of teaching when the study took place. She was teaching in a boys' grammar school catering for the upper thirty percent of the ability range of the area. Teacher Three agreed to keep a diary of her lessons with a second year class and a fourth year class.

1. CLASS 2

A. The structure and readability of the text books

Figures 37a and 37b are summaries of the analyses of the two books used by Teacher Three with Class 2: Miller's Physical Basis of Geography and Money's Basic Geography (Books 30 and 31).

SUMMARY ANALYSIS OF BOOK 30: Miller The Physical Basis of Geography

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	80	0	0	14	0	6	20
Textual references to illustrations: None:	-	-	-	0	-	0	0
In passing:	-	-	-	25	-	100	50
Detailed:	-	-	-	75	-	0	50
Percentage of illustrations used in Questions/Activities	-	-	-	17	-	0	11

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 15

	Non-experiential	Experiential
Percentage of all Questions/Activities	91	9
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	20	33
Integrating	57	67
Open ended	23	0
Valuing	0	0

Fig. 37a

SUMMARY ANALYSIS OF BOOK 31: Money Basic Geography

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust.
Percentage of total print area:	51	4	8	31	3	3	49
Textual references to illustrations: None:	-	75	25	6	0	0	14
In passing:	-	0	0	10	25	0	9
Detailed:	-	25	75	84	75	100	77
Percentage of illustrations used in Questions/Activities	-	25	25	13	0	0	14

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	71	29
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	29
Integrating	97	71
Open ended	3	0
Valuing	0	0

Fig. 37b

Fig. 37. Summaries of the analyses of the text books used by Teacher Three with Class 2

Figure 37 shows that Miller comprises mostly text with relatively small proportions of diagrams and tables as illustrations. Money devotes about half the print area of the book to text with most of the illustrations being in the form of diagrams. Both books describe their illustrations in some detail in the text, although only a small proportion are used as the bases of questions or activities. Neither book devotes more than a quarter of its text to questions and activities. The questions and activities which are included in both books are overwhelmingly non-experiential with a majority requiring the integration of prior knowledge into the current study. Miller also includes a number of open-ended questions.

Although the authors of neither of the two books used with Class Two specify the age group for which their books are intended, Money refers in his Introduction to 'the middle school geographer', from which it may be assumed that he means fourth and fifth year pupils. Furthermore, it may be inferred from the style of questions included in both books that they are intended for those pupils preparing for public examinations at sixteen, and therefore that they would normally be used by pupils in their fourth and fifth year of secondary education (14 - 16 years). Appendix I shows that reading levels according to the Flesch and Fry measures are rather higher than this. The readability scores certainly suggest that both books are likely to be too difficult for pupils with a mean age of 12.11 years. The unsuitability of Money for this class is borne out by the results of a cloze test (Figure 38).

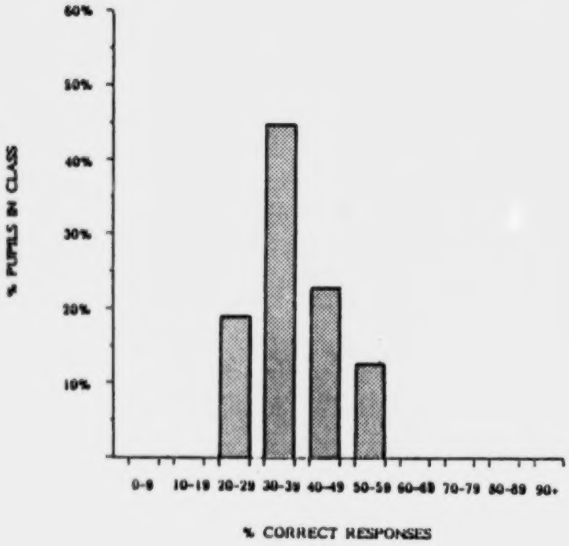


Fig. 38. The results of a cloze test on Book 31: Basic Geography with Class 2 of Teacher Three. Pupil N = 31; Deletion N = 50; Mean = 38%

The cloze test revealed that the mean score for the class was 38%, suggesting that the class as a whole would be working at the frustration level, while the distribution of scores shows that 65% of the pupils scored below the frustration level, and of the remainder, none scored at the level of independence (60%).

While Miller consists mainly of textual description of the physical features, Money includes a relatively high proportion of diagrams. Neither book includes many photographs, maps or sources of statistics. The books do assist in the interpretation of the graphic illustrations, but few are used as the bases of questions and activities. The readability levels of the books are above the abilities of the majority of the pupils in the class. It would appear that a course based on these two books would primarily involve the acquisition of factual content, mainly transmitted through text.

B. Record of lessons

a) The written diary

Figure 39 is a summary of the diary kept by Teacher Three of her lessons with Class 2.

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SUMMARY OF DIARY OF TEACHER 3  :CLASS 2  :N.= 30

Volume of text book usage: No. of sessions recorded:22 (22  school periods)
No. of sessions in which text books used:  12  :  55%

Text books used during period of diary (and no. of sessions used):
No.30: Miller; Physical Basis of Geography (8) No.31: Money; Basic Geography (6)

Of the 12 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 3(25%);      made reference to elements of tb:9(75%);
used tb as basis for exposition: 0 (0%);  taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text:  3;  Photo:  0;  Map:  0;  Diagram:  9;  Graph:  0;  Table:  0;

Pupil activities: Pupils studied the text book alone during 6 sessions.
Of these, none were before and 6 were after teacher explanation.
Pupils copied information from the text book during 10 sessions as follows:
Text:   0  Photo:   0  Map:   0  Diagram:   10  Graph:   0  Table:   0

Pupils' completion of Questions/Activities
There were a total of 24 Q/As.  Of these 83% were Non-exper'l; 17% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
 0( 0%) orally;  24(100%) in writing (10 (42%) of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk 30: 14 (58%);  Bk 31: 0 (0%);

Non-experiential questions (N = 20):
Rhetorical: 0%; Confirming: 85%; Integrating: 10%; Open Ended: 5%;Valuing: 0%

Experiential questions (N =  4):
   %             Confirming    Integrating     Open Ended     Valuing     TOTAL
Observing            0              0              0             0
Communicating       25             25              0             0          50
Comparing            0              0              0             0           0
Organizing          25              0              0             0          25
Experimenting        0              0              0             0           0
Inferring            0              0              0             0           0
Applying            25              0              0             0          25
TOTAL %             75             25              0             0         100

Experiential Q/As referred to data sources as follows (% references, N= 4):
Atlas:    0%;      Other text:  0%;     Photo:  0%;          Map:  0%;
Diagram:100%;      Graph:       0%;     Table:  0%

Origin of data sources referred to in Experiential Q/As:
  %            Bk30         Bk31
Photo            0            0
Map              0            0
Diag           100            0
Graph            0            0
Table            0            0
TOTAL %        100            0
```

Fig. 39

The summary of the diary of lessons with Class 2, shows that Teacher Three only made specific use of the books in half the sessions recorded. The two text books were used more or less equally. When a text book was used, the teacher usually referred to specific parts of the book while on the other occasions the books were used as the basis for written work. It was the school's policy that every lesson be followed by homework and accordingly the written work set as homework has been included in the analysis of the session preceding it. When pupils were required to study part of the text books alone, this always took place after the teacher had taught the substance of the lesson orally. When they copied portions from the books, the chosen portion was always a diagram.

All the activities which the pupils were required to complete during the period of the diary were to be presented in writing. About half were teacher initiated and usually comprised the instruction to 'write notes on...'. Of the activities selected from the text books, most were non-experiential and required confirmation. Only 10% of these activities required the integration of some prior learning. The experiential questions were all based on diagrams selected from Miller and again most were categorized as confirming and integrating.

C. Pupils' responses to their books and lessons

Figures 40a and 40b show the perceptions of Class Two of the way in which information was presented in their two text books.

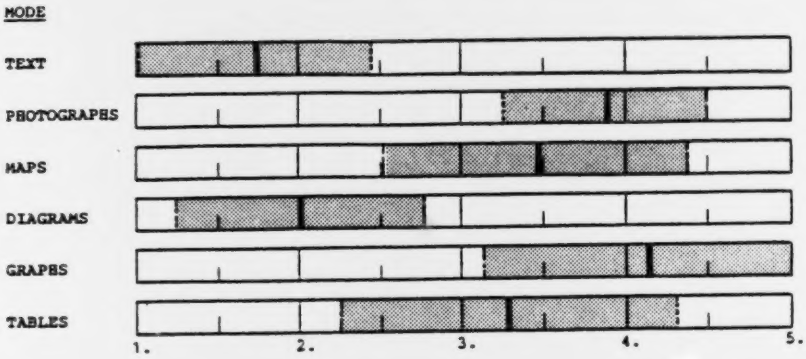


Fig. 40a. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 30 by the pupils of Teacher Three, Class 2. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

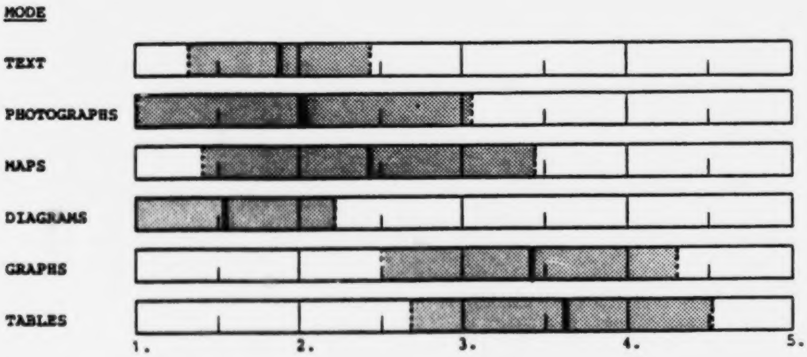


Fig. 40b. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 31 by the pupils of Teacher Three, Class 2. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Their perceptions of Miller (Book 30) as comprising primarily text, with some use of diagrams and tables and very little use of other modes of presentation accorded precisely with the actual proportions recorded in Figure 37a. Their perceptions of Money (Book 31) were of diagrams as being the primary presentation mode, with text and photographs of less significance. This differed from the relative proportions as revealed in Figure 37b insofar as the amount of text exceeded diagrams, although these two modes together comprised 83% of the total print area. Similarly the photographs were seen as being more common than maps, even though the actual situation was the reverse of this.

Figure 41 shows the perception of Class 2 pupils of the use of these presentation modes in their lessons. Figure 42 shows their assessment of the presentation modes. While they suggested that text was used most commonly in their lessons, Class 2 recorded a relatively low evaluation of this mode of presentation, while diagrams were perceived as being used second most frequently but were regarded as being of highest value by the pupils. The pupils also regarded photographs as being valuable but perceived them as being very rarely used in their geography lessons.

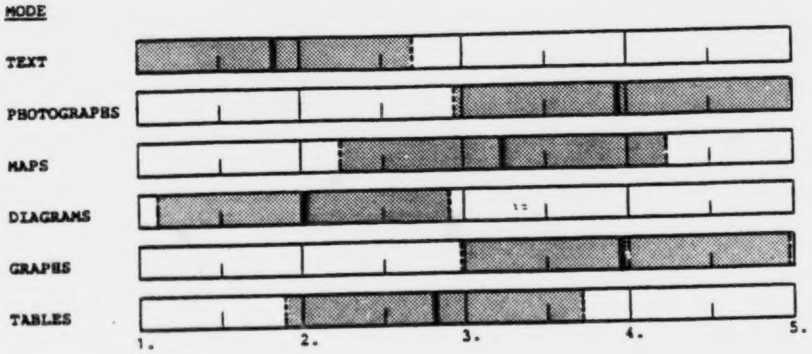


Fig. 41. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Three, Class 2 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

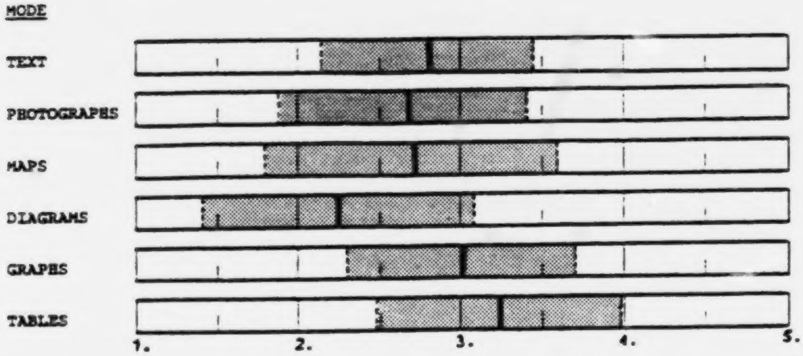
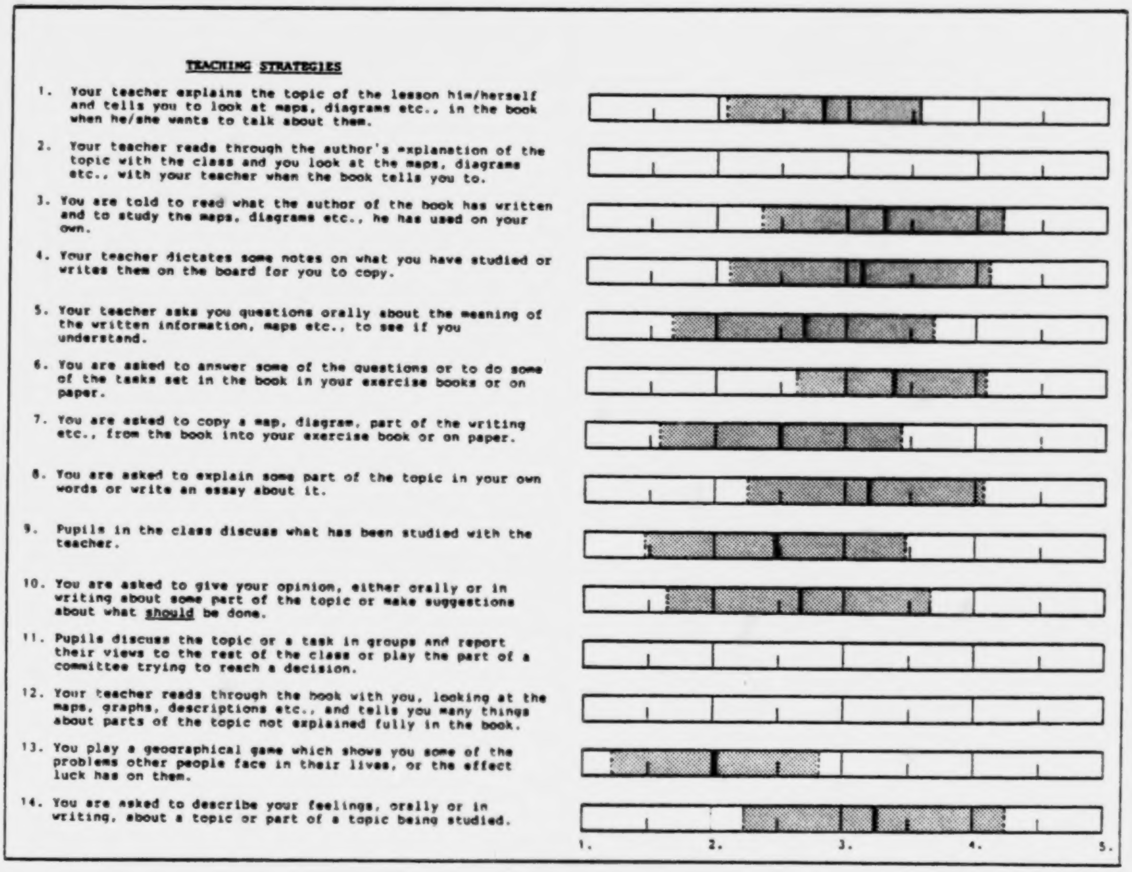


Fig. 42. Pupils' assessment of the six modes of data presentation: Teacher Three, Class 2 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 43 shows the evaluation of Class Two of the fourteen teaching strategies. The class was in agreement that they had not experienced Strategies 2, 11 and 12 which related to the teacher studying the text book with the class and pupils discussing aspects of geography with one another. The most positive valuation was accorded to geographical games (13), while discussing with the teacher, copying information, oral questioning by the teacher and giving opinions were also valued highly (9, 7, 10 and 5). On the other hand, explaining the topic in their own words, describing their feelings, studying the book on their own and answering questions taken from the text book (8, 14, 3 and 6) were valued much less, and all were accorded mean scores which suggest that the valuation was low in both absolute and relative terms.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 43. Pupils' assessment of the fourteen teaching strategies
Teacher Three, Class 2.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 4

A. The structure and readability of the text book

With Class 4, Teacher Three used Tolson & Johnstone's A Geography of Britain . The back cover of this book states that it is intended 'primarily for pupils of 14 - 16 who are preparing for examinations'. Figure 44 summarizes the analysis of this book.

SUMMARY ANALYSIS OF BOOK 52: Tolson and Johnstone A Geography of Britain

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	19	28	2	4	3	56
Textual references to illustrations: None:	-	82	11	0	0	100	44
In passing:	-	0	11	0	0	0	4
Detailed:	-	18	78	100	100	0	52
Percentage of illustrations used in Questions/Activities	-	18	0	0	0	100	15

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 10

	Non-experiential	Experiential
Percentage of all Questions/Activities	41	59
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	22	77
Integrating	56	15
Open ended	22	8
Valuing	0	0

Fig. 44. Summary of the analysis of the text book used by Teacher Three with Class 4

Figure 44 shows that this book devotes over half its print area to illustrations, with particular emphasis being given to maps and photographs. The other modes of data presentation occupy less than ten percent of the total book. The majority of the illustrations are described in the text in some detail, although the proportion of graphic illustrations which are used as the bases for questions and activities is low. Similarly, the textual portion of the book includes very few questions and activities. Of the questions and activities which are included, the majority are experiential. The experiential questions and activities mainly require pupil confirmation, while the majority of non-experiential involve integration.

Appendix I shows that the book has a reading level of 12 to 14 on both the Flesch and Fry scales. It would seem to be well within the abilities of this class with its mean age of 14.11. This was confirmed by the cloze test which showed a class mean score of 49%, well within the limits for instructional use. Figure 45 suggests that 7% of the class could use the book independently, while 7% recorded scores which would suggest that they might find difficulty at the instructional level.

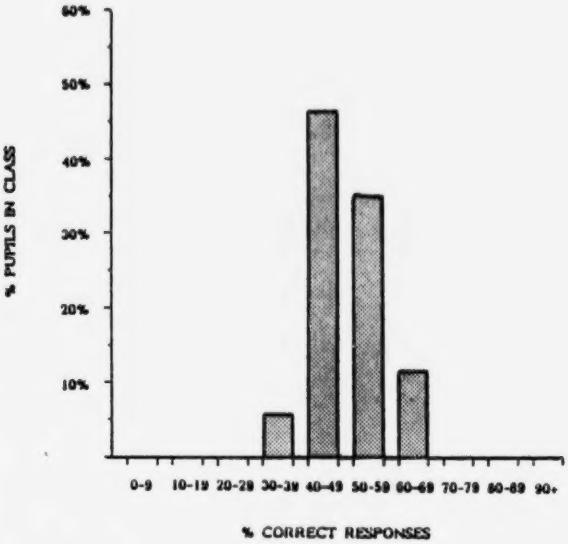


Fig. 45. The results of a cloze test on Book 52: A Geography of Britain with Class 4 of Teacher Three. Pupil N = 27; Deletion N = 78; Mean = 49%

B. Record of lessons

a) The written diary

The summary of the diary of lessons with this class (Figure 46) shows that the text book was used at some time during two thirds of the 21 sessions 35 (66%). She frequently referred to elements of the book as part of her own exposition, placing particular emphasis on maps and diagrams. Pupils studied the book alone on 9 occasions, usually after the teacher had explained the topic. Maps and diagrams were copied from the text book.

During the period of the diary, the majority of the questions and activities completed by the pupils were selected from the text book and were completed in writing. Most of the questions and activities were experiential frequently based on resources from the text book, and usually requiring confirmation. A quarter required the integration of some prior knowledge. The teacher provided a graph and two tables in spirit duplicated form while the pupils used the atlases with which they had been issued, on one occasion only.

SUMMARY OF DIARY OF TEACHER 3 :CLASS 4 :N.= 24

Volume of text book usage: No. of sessions recorded: 32 (44 school periods)
No. of sessions in which text books used: 21: 66%

Text books used during period of diary (and no. of sessions used):
No.52: Tolson & Johnstone; A Geography of Britain (21)

Of the 21 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 5 (24%); made reference to elements of tb: 16 (76%);
used tb as basis for exposition: 0 (0%); taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text: 0 ; Photo: 0 ; Map: 14 ; Diagram: 7 ; Graph: 0 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 9 sessions.
Of these, 2 were before and 7 were after teacher explanation.

Pupils copied information from the text book during 5 sessions as follows:
Text: 0 Photo: 0 Map: 2 Diagram: 3 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There were a total of 33 Q/As. Of these 15% were Non-exper'l; 85% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
1 (3%) orally; 32 (97%) in writing (8 (24%) of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk.52: 25 (76%); Other: 8 (24%)

Non-experiential questions (N = 5):
Rhetorical: 0%; Confirming: 0%; Integrating: 80%; Open Ended: 20%;Valuing: 0%

Experiential questions (N = 28):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	0	4	0	0	4
Comparing	29	7	0	0	36
Organizing	39	0	0	0	39
Experimenting	0	0	0	0	0
Inferring	0	14	4	0	18
Applying	4	0	0	0	4
TOTAL %	71	25	4	0	100

Experiential Q/As referred to data sources as follows (% references, N=13):
Atlas: 8%; Other text: 0%; Photo: 0%; Map: 46%;
Diagram: 15%; Graph: 8%; Table: 23%

Origin of data sources referred to in Experiential Q/As:

%	Bk52	Other
Photo	0	0
Map	46	8
Diag	15	0
Graph	0	8
Table	7	15
TOTAL %	68	31

Fig. 46

C. Pupils' responses to their books and lessons

Figure 47 shows the perception of Class 4 of Tolson and Johnstone (Book 52). These pupils correctly perceived text and maps as being the major modes of presentation (together comprising 72% of the total print area), but recorded the diagrams, which comprised only 2% of the print area as being more common than photographs which comprise 19%.

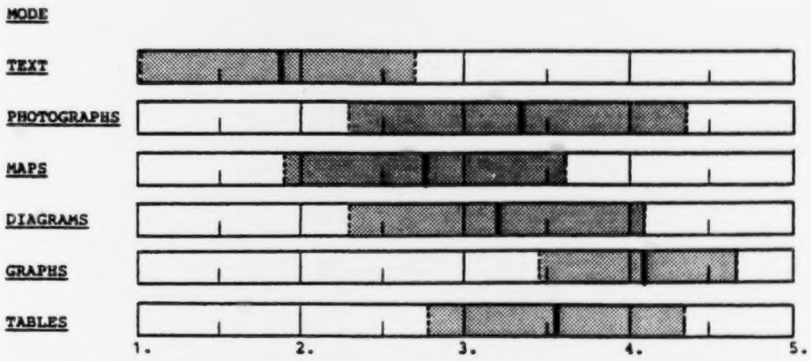


Fig. 47. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 52 by the pupils of Teacher Three, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 48 shows the perceptions of Class 4 pupils of the use of the presentation modes and Figure 49 shows their assessment of the relative values of the six modes. These pupils regarded text as being used most frequently in their lessons, but placed it third in their assessment. Photographs were regarded as being rarely used and were rated fourth in value although the mean rating of 2.75 would suggest that they regarded photographs as having considerable value to them. Overall, these pupils appear to regard all the presentation modes as being of value even though their experience of photographs, graphs and tables seems to have been limited.

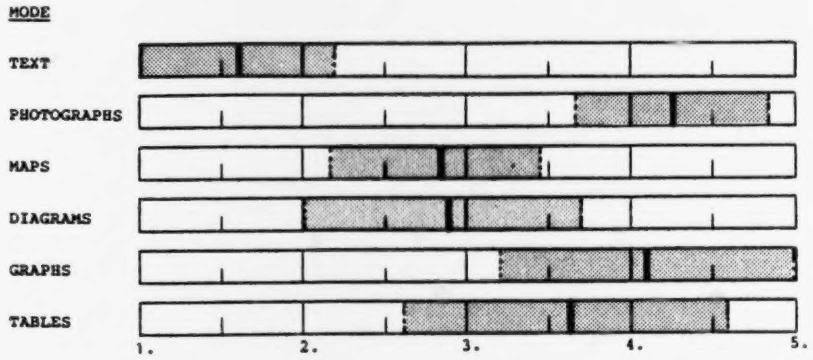


Fig. 48. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Three, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean)

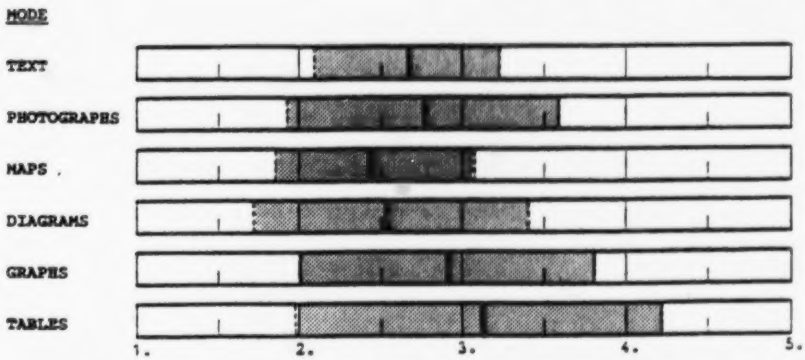
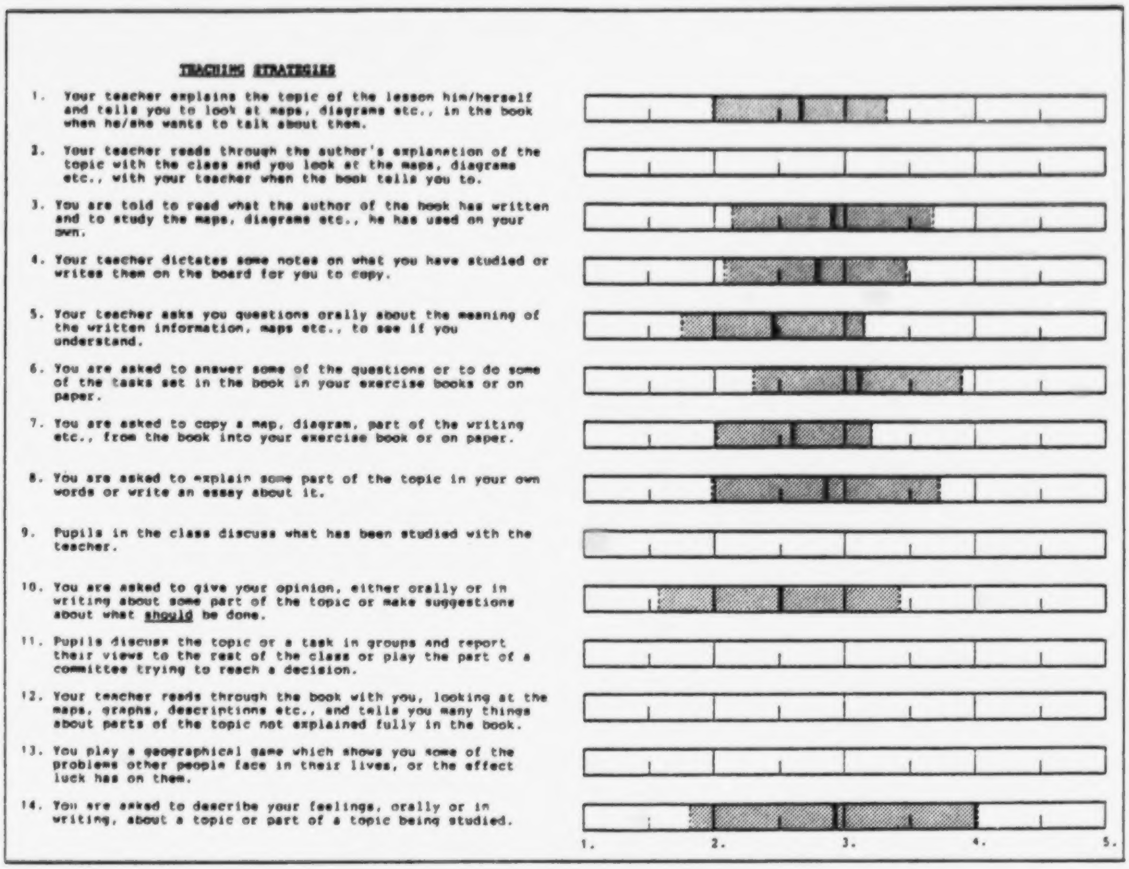


Fig. 49. Pupils' assessment of the six modes of data presentation: Teacher Three, Class 4
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 50 shows the assessment of the teaching strategies of pupils of Class 4. These pupils were also in agreement that they had not experienced strategies which related to the teacher studying the book with the class either with or without extra information being offered, pupils discussing the topic with the teacher or between themselves, and the playing of geographical games (2, 9, 11, 12 and 13). These pupils placed particular value on teacher oral questioning of the class, pupils being asked to give their opinions, copying from the text book and teacher exposition (5, 10, 7 and 1). Although reading the book alone (3) and describing feelings (14) were rated as of relatively low value, only "answering questions from the book" (6) received a rating of greater than 3, suggesting a low evaluation in absolute terms.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 50. Pupils' assessment of the fourteen teaching strategies
Teacher Three, Class 4.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER THREE BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

The responses of pupils to the various parts of the questionnaire would suggest that they were aware of the full presentation styles of their text books, but perceived that the choice of elements from the books for their lessons placed particular emphasis on diagrams in the case of Class 2 and maps in the case of Class 4. They would also seem to have seen the written text as being of much greater importance than would be suggested by the diary of their lessons. In terms of their valuation of the various presentation modes, text was not regarded highly, while maps and diagrams were regarded as being of greater value. Class 2 regarded photographs as being of considerable value, while both classes agreed that graphs and tables had the lowest value for them of all the presentation modes. For Class 2 these latter two modes received ratings suggesting low evaluation in absolute terms while for Class 4 only tables were rated low in these terms.

4. THE DISCUSSION-INTERVIEW WITH TEACHER THREE

During the course of the discussion, Teacher Three showed considerable unhappiness about her teaching situation, the resources at her disposal and the conditions under which she taught. The initial question concerning the relationship between the text books and the syllabus of the school elicited the comment that the syllabus was based on the way in which the Head of Geography thought that geography should be taught and that it was originally constructed around an old set of books edited by Preece and Wood. The teacher stated that most of her teaching was based on diagrams and maps taken from a variety of text books purchased herself and reproduced on a spirit duplicator. For a number of years, new text books had only been bought to make up existing sets, so long as they remained in print, or as replacements, if they fitted in with existing syllabuses. However, the teacher considered that the courses were adequately resourced in that every pupil in the school was issued with a text book for his own use while examination candidates were issued with appropriate text books to keep for the duration of their two year course.

The teacher herself did not like the books, regarding them as old fashioned in format and out of date in content, although she did suggest that they were quite adequate to ensure that pupils obtained pass grades in the G.C.E. Ordinary Level examinations. The higher grades obtained by some pupils were, she felt, largely due to the extra information provided during class time. In discussing teaching resources, it emerged that text books comprised the only resources of the school, and although the teacher expressed an interest in using slides or filmstrips, the lack of any blackout facilities precluded this. Wall displays designed to arouse interest in current matters of geographical concern and gleaned from various geographical journals and magazines, to which the teacher subscribed privately, appeared to be the only alternative resources available.

Regarding the use of the written text of the books, the teacher insisted that she would never ask pupils to read in the classroom. Reading was considered to be solely a matter for homework since the classroom environment was not suitable for useful study. It later transpired that reading was also frequently used as a desperation measure to fulfil the school requirement that homework be set at the conclusion of every lesson. The teacher felt that pupils learned little from reading by themselves, although she did suggest that reading might sometimes help to introduce a new topic and help pupils to recognize new terms when they were encountered in class. The suggestion that the readability of the texts might have an influence on the ability of the pupils to learn from their own reading was dismissed: "readability is never a problem. The readability of text books will never be above the level of our pupils". She added: "I prefer to tell pupils. When they read something for themselves, they never understand it as well as when they have been told, even though they are grammar school pupils". The teacher stated that she considered that reading was an important part of geographical education: "It is part of a pupil's whole education to be able to read and glean information from a book". The pupils' perceptions that the written text was used a great deal and their high evaluation of it was explained: "They are conditioned throughout the school to thinking that reading and learning the text book is important". However, throughout the conversation it was emphasized that the teacher saw her role as primarily to instil in her pupils information to enable them to pass the examinations regardless of the strengths or weaknesses of the text book or the pupils' skills in using it.

Photographs were described by the teacher as important for two reasons. Firstly to help pupils to imagine new features: "roches moutonnées are difficult to imagine from descriptions and diagrams"; and secondly, to be used in conjunction with maps for examination preparation. In view of the emphasis in the second year syllabus on meteorology and climate, there was seen as being little use for photographs, while the pressure of time to "cover the syllabus" limited their use in the fourth and fifth years. However, the photographs in Tolson and Johnstone were regarded by the teacher as good and relevant to the pupils' examination needs and therefore, she felt, worthy of discussion in class. Similarly, she stated that she had found some of the questions and activities suggested by these authors to be useful for her class. Although the diary showed that a number of questions from the text book had been used, no photograph work took place during the 32 sessions recorded.

On the use of maps in geography classes, perceived as being used frequently in lessons and valued by Class Four pupils, but shown to be of less importance by Class Two pupils, the teacher emphasized that map work from Ordnance Survey maps was a compulsory part of the examination and therefore was a major part of the fourth and fifth year course. The activities based on Ordnance Survey map extracts included in Tolson and Johnstone were seen as being especially helpful here as "mapwork was my weakest area at school but since I started teaching I have improved". However, the thematic maps included in the text book were seen as being of less importance as it was felt that pupils needed notes from which to write essays rather than information summarized on maps. It was, on the other hand, seen as essential for pupils to learn the locations of places mentioned in their course for the purposes of the examination. To this end the teacher found it necessary to add substantially to the number of places located on the thematic maps included in the text book as well as to update regularly. One particular problem perceived was in keeping pupils up to date with plant closures in the United Kingdom between the teaching of a specific region in the fourth year and the examination at the end of the fifth year. This was achieved by regular updating sessions of exercise book sketch maps during the fifth year. This teacher admitted that she was unconvinced by the real need for this degree of accuracy and specificity but feared the effects on her examination results of not maintaining such standards. On the skills of extracting information from maps the teacher considered that "extracting information is more suited to sixth form work. I daren't take time to do anything like that in the O-level course", although the copying of maps and annotating them from notes were cited as a suitable homework task.

The role of maps with Class 2 was less clear since "meteorology does not lend itself to map use". Pupils were required to copy a map of the climatic regions of the world and this was referred to throughout the course as the climate of each region was described. The atlases, issued to every pupil, were regarded as poor and therefore rarely used. The main influence on the second year curriculum appeared to be the fact that the climate and meteorology sections of the examination syllabus were taught in that year and not returned to until the fifth year revision period - "so its got to be covered thoroughly so they remember it".

Although maps appeared to be rejected for much classroom use due to the perceived pressure of time, diagrams were acknowledged as being of great importance at every stage and with both classes. "I use a lot of diagrams to show how physical features are formed or how an iron and steel works operates. I find that diagrams are easy to learn personally and I hope my pupils feel the same. Visual things are easy to remember and then the dictated notes can just be lists of important points".

With Class Two the teacher stated that the diagrams in Money were particularly good as she felt that the use of colour helped pupils to relate the diagrams to the photographs. Whereas pupils had previously been asked to copy the diagrams and learn them, more recently all second year pupils had been issued with their own copy of Money. "Now they can just learn them." The meaning of the diagram was often emphasized by pupils writing notes based on a diagram after the teacher had explained it. "I tend to explain everything first before they do anything. They will miss too much out if they do it alone."

For Class 4, the teacher was less happy about the diagrams in Tolson and Johnstone, feeling that they lacked sufficient detail. She remedied this perceived lack of detail by using overhead projector transparencies copied from other texts. The nature and origins of urstromtäler were cited as particular problems in this regard. The teacher explained: "there is so much factual knowledge and knowledge of terminology needed in the multiple choice paper of the examination that I am hard pressed to cover it all". The real importance of diagrams was explained in relation to the photograph questions which were part of the examination. "So long as they can relate the diagram to the photograph and name the parts, they can ignore the photograph itself".

Graphs and tables of figures were regarded by all pupils and the teacher to be of relatively low importance in their geography curriculum. The teacher stated that "I don't like graphs and tables - they don't get all that many extra marks, locations on sketch maps get more". The skills of graph drawing from climatic tables were taught in the second year, although the notes which accompanied them seemed to be regarded as of greater importance by the pupils. The teacher found that the exercises in Tolson and Johnstone which required pupils to draw graphs from tables of figures and to comment on them were useful homework exercises to reinforce the information given in class, but it would seem from their evaluation of the presentation modes that pupils were unconvinced of the value of such exercises.

There was general agreement between the classes and the teacher regarding those strategies which were used in geography lessons. An exception with Class Two occurred in the case of Strategy 13, involving the use of a geographical game, which received the highest rating for value but which the teacher did not include amongst her usual teaching strategies. It was explained that this class had played a geographical game at the end of the previous term and had apparently enjoyed it and learned from it. The Head of Department had expressed some misgivings about using such strategies other than at the end of term. Removing this item from the list of strategies and calculating Spearman's R revealed a correlation between the pupils ranking of strategies for value and the teacher's ranking for contribution to the learning process of 0.77 which would suggest a positive correlation. Similarly, with Class 4, there was only disagreement between class and teacher perception regarding Strategy 9, which referred to class discussion. The teacher regarded this as being a common classroom strategy while the class recorded it as not being used. Excluding this item from the Spearman's R calculation resulted in a correlation of 0.76, again suggesting a positive correlation between teacher's and pupils' evaluation of the teaching strategies.

Regarding the specific teaching strategies, the teacher suggested that Class Four had been conditioned throughout the school to regard reading and learning the text book as being important and therefore had recorded high evaluations for this item. The high evaluation of dictation was further explained as indicating a view that it was the responsibility of the teacher to prepare pupils for public examinations and that this was most effectively done by ensuring that each pupil had a good set of notes to be learned either through dictation or through suggesting appropriate diagrams or maps to be copied. Such a view was less well developed in Class Two pupils. The questions and activities in the text books received low evaluations as they were viewed as involving extra work with little benefit accruing for examination purposes. This explanation was also used to justify pupils' reactions to activities involving their feelings.

In summarizing her views on the role of text books, Teacher Three explained that the books she used with Class 2 were useful for their diagrams and that although the reading level of the text was within the capacity of her pupils, the questions and activities were too difficult. With the text book for Class 4 the maps and descriptions were useful but the questions and activities did not match the way the course had to be taught for the examination. The teacher regarded the questions and activities as being "good thinking questions rather than geography questions".

The teacher explained that "the O-level course is changing and it is less and less necessary to teach it as we do. We are not changing. I have offered to rewrite the fourth year syllabus but the Head of Department does not want to change". The changes the teacher would like to introduce included "practice in extracting information - data response. ... Lots of questions which ask them to find information rather than just telling them. That would help them to think." Although the teacher did not consider that any text book could be adequate for a whole O-level course, unless a text book were to be written for each Board's examination, she expressed a willingness to follow one of the modern text book courses in the lower school, and quoted the Oxford Geography Project series or the Patterns in Geography series. She quoted an occasion when she had given a lesson based on a photocopy of part of Oxford Geography Project 2 to a third year class, "the worst class in the school", for an inspection by the Headmaster. "He was really impressed. He said 'You didn't tell them a thing. You just asked questions and made them give you the information'".

For this teacher the geography examination syllabus was the essence of the curriculum and the text books merely sources of maps, diagrams amd other resources to use when appropriate. There was much tension between the teacher and the Head of Department regarding an appropriate curriculum. The unsuitability of the text books used by Class Two added to the stress felt by the teacher as she strove to meet the requirements of the Head of Department, expressed in internal examination papers. While the Head of Department, and the expectations of the school and pupils for examination preparation appeared to influence the way in which Class 4 was taught despite the fact that the text book in use is both relatively modern for this school and within the reading capacity of the class, the teacher's conviction that the examination success of her pupils was her responsibility and that the key to O-level success was detailed knowledge of the factual content would still seem to have been the main influence on her teaching and use of text books.

IV. TEACHER FOUR

At the time when the data for this study was being collected, Teacher Four was Head of the Geography Department of a secondary modern school. In his tenth year of teaching, he was a non-graduate and had taught pupils at all levels including the Advanced Level of the G.C.E.

Teacher Four kept a diary of one class, a fourth year group in which pupils were preparing for both the Certificate of Secondary Education and Ordinary Level of the G.C.E. examinations in geography. The class used The British Isles (Wilson, Book 55) and The British Isles (Young and Lowry, Book 56).

1. CLASS 4

A. The structure and readability of the text books

Both these books are intended for use by pupils in their fourth and fifth years preparing for public examinations. Figures 51a and 51b summarize the analyses of these two books. These Figures show that Wilson devotes most of the print area to text with photographs and maps occupying the majority of the space allocated to illustrations. Diagrams and tables occupy a relatively small area and there were no graphs in the pages sampled. Young and Lowry devotes a larger proportion of its print area to illustrations, with photographs and maps being most common. Wilson provides detailed explanations for many of the illustration in his book, while Young and Lowry discuss fewer than a third of their illustrations in detail. Young and Lowry use almost half of the illustrations as bases for pupil work. While Wilson does not include any questions and activities, Young and Lowry devote a fifth of their text to questions and activities, the majority of which are experiential and require the pupils to integrate prior knowledge into the current topic. The non-experiential questions and activities are divided between rhetorical and an equal proportion of confirming and integrating questions. There are relatively few open-ended questions.

SUMMARY ANALYSIS OF BOOK 55: Wilson The British Isles

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	63	22	10	3	0	2	37
Textual references to illustrations: None:	-	0	0	0	-	0	0
In passing:	-	29	25	50	-	33	29
Detailed:	-	71	75	50	-	67	71
Percentage of illustrations used in Questions/Activities	-	-	-	-	-	-	-

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 0

Fig. 51a

SUMMARY ANALYSIS OF BOOK 56: Young and Lowry The British Isles

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	24	16	6	1	8	56
Textual references to illustrations: None:	-	25	47	33	0	63	40
In passing:	-	44	11	67	0	38	30
Detailed:	-	31	42	0	100	0	30
Percentage of illustrations used in Questions/Activities	-	25	58	67	0	50	45

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 21

		Non-experiential	Experiential
Percentage of all Questions/Activities		29	71
Percentage of each type of Question/Activity	Rhetorical	19	-
	Confirming	38	33
	Integrating	38	59
	Open ended	6	8
	Valuing	0	0

Fig. 51b

Fig. 51. Summaries of the analyses of the text books used by Teacher Four with Class 4

Appendix I shows that in tests of readability, Wilson achieves a mean score of 17 on the Flesch scale and 16 on the Fry scale with individual passages ranging from 14 to over 20. Young and Lowry achieves a mean score of 16 on the Flesch scale and 15 on the Fry scale, with a range of from 14 to 17. This suggests that the books are generally appropriate for this fourth year class, and the suggestion is borne out by the results of a cloze test on Wilson (Figure 52). The results reveal that the class mean score was 44%, which indicates that the book may be used at the instructional level, although 22% of the pupils were working at frustration level.

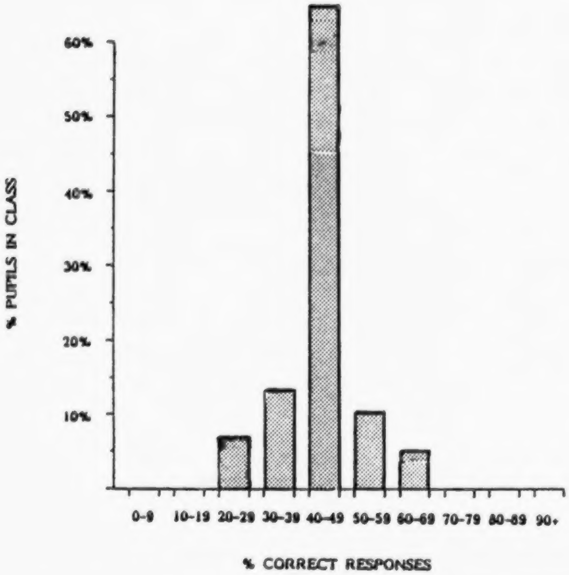


Fig. 52. The results of a cloze test on Book 55: The British Isles with Class 4 of Teacher Four. Pupil N = 29; Deletion N = 50; Mean = 44%

B. Record of lessons

a) The written diary

Figure 53 is a summary of the diary kept by Teacher Four of his lessons with Class 4. It shows that a text book was used in over half the sessions recorded. Wilson was the main text book used. On nearly half the occasions when this text book was used, the teacher made no reference to it in his exposition. For the rest, his use of the book for specific references, especially for maps, and teaching directly from the book were equally divided. The pupils studied portions of the books alone on 7 occasions which included 4 when they were referred to the book after the teacher had explained the topic and 3 occasions when pupils were required to read an appropriate section of the text book in preparation for the teacher's exposition. Maps were the main feature to be copied from the books.

While Wilson does not include any questions or suggestions for activities, none of the questions or activities in Young and Lowry was used, and neither did the teacher initiate any activities using the resources of the text books other than to require pupils to write formal answers to essay questions taken from past Ordinary Level examination papers.

SUMMARY OF DIARY OF TEACHER 4 :CLASS 4 :N.= 29

Volume of text book usage: No. of sessions recorded: 28 (48 school periods)
No. of sessions in which text books used: 18: 64% (3 sessions were devoted to practising examination questions based on O.S.Map extracts: 11%)

Text books used during period of diary (and no. of sessions used):
No.55: Wilson; The British Isles (15)
No.56: Young & Lowry; The British Isles (3)

Of the 18 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 8 (44%); made reference to elements of tb: 5 (28%);
used tb as basis for exposition: 2 (11%); taught entirely from tb: 3 (17%);

No. of sessions in which elements received particular reference:
Text: 5 ; Photo: 1 ; Map: 5 ; Diagram: 3; Graph: 1 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 7 sessions.
Of these, 3 were before and 4 were after teacher explanation.

Pupils copied information from the text book during 6 sessions as follows:
Text: 1 Photo: 0 Map: 4 Diagram: 2 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
The pupils were required to write two "examination style" essays with the help of their text books during the period of the diary. These were non-experiential and open ended.

Fig. 53

b) Audio recording of lesson

The teacher made a recording of one 35 minute lesson taught some time after the period of the diary when the class had moved on to a study of Western Europe. At that time the class was using Dobson and Virgo's North West Europe (Book 17). The class was referred to a text book map of Rotterdam and the teacher devoted some 25 minutes to describing the patterns of industrial activity shown on the map and then comparing Rotterdam with Amsterdam. A part of the text was read to the class and the site and situation of Amsterdam were then described. Throughout the 25 minutes only one question was asked: an apparently open ended question concerning the commercial activities of Amsterdam but which was in fact seeking confirmation that the most famous aspect of Amsterdam is the diamond industry. After the teacher-exposition, the class was then asked to copy the map before writing their own notes to summarize the trade of Rotterdam and the reasons for the growth of the port from the text book account and the teacher exposition.

C. Pupil responses to their books and lessons

Figure 54 shows the pupils' perceptions of the presentation mode usage of one of their text books: Wilson (Book 55). The chart shows that they perceived the text to be the most common mode of communication in the book, a perception which accorded with the measured results as shown in the analysis of the text books (Figure 51a). These pupils perceived the maps and diagrams to be the next most common modes whereas the area devoted to photographs exceeded the combined area of both maps and diagrams.

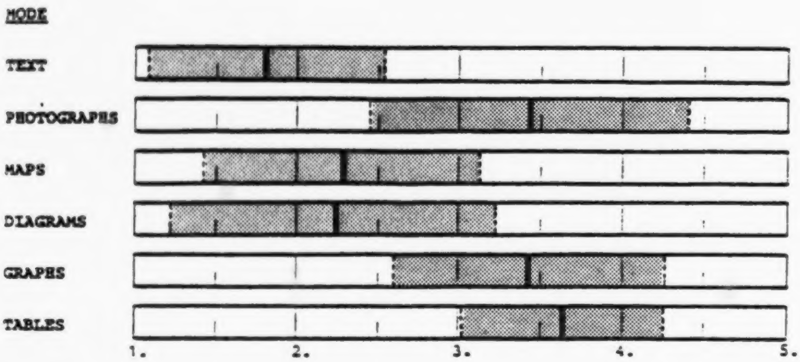


Fig. 54. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 55 by the pupils of Teacher Four, Class 4. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

The perception of these pupils of the usage of the various modes in their geography lessons (Figure 55) was very similar, with the text being seen as used most frequently, followed by maps and diagrams, and photographs seen as being used even less than graphs. Their assessment of the modes (Figure 56) revealed that they regarded maps and diagrams as being of greater significance than text, while photographs, graphs and tables were regarded as of least significance.

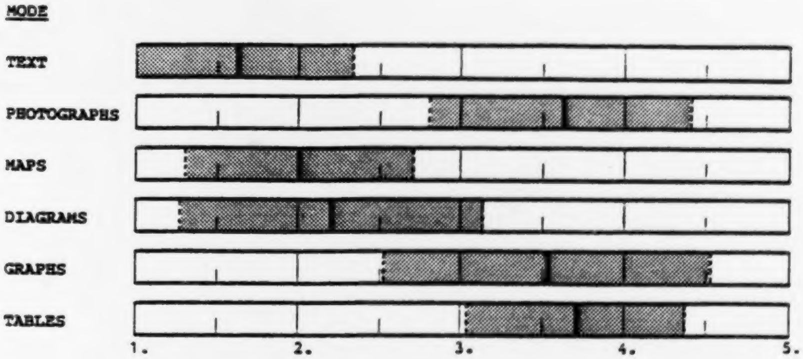


Fig. 55. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Four, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

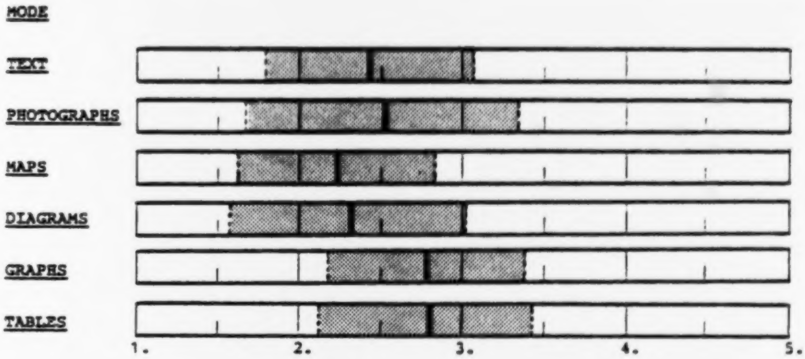
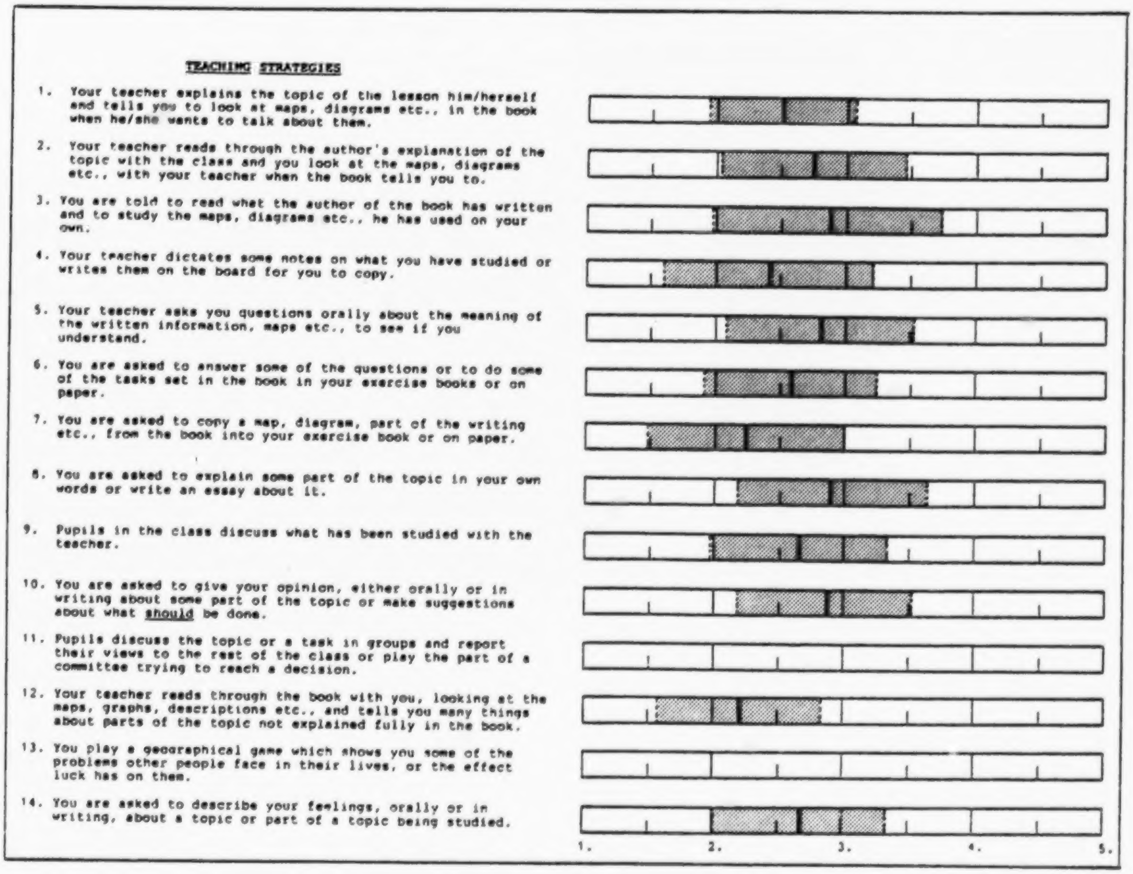


Fig. 56. Pupils' assessment of the six modes of data presentation: Teacher Four, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 57 which shows the pupils' attitudes to the various teaching strategies shows that close contact with the teacher was regarded as being of most value. Thus strategies which involved copying, the teacher reading the book with the pupils, dictation and teacher exposition (7, 12, 4 and 1) were held in greatest esteem. These pupils denied having experienced geographical games or inter-class discussions (13 and 11) and regarded giving their own opinions, reading the book on their own and explaining a topic in their own words (10, 3 and 8) as being of least value. All the strategies which had been experienced were rated as being of some value.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 57. Pupils' assessment of the fourteen teaching strategies Teacher Four, Class 4.

(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. SUMMARY OF THE TEACHING STYLE OF TEACHER FOUR BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Four appeared to regard geography as a body of factual knowledge held by the teacher, and to perceive his own role solely in terms of passing on this factual knowledge to his pupils. The text book serves as an aide memoire and source of illustrations for the teacher in his expositions. The pupils perceive maps and diagrams to be used most often in their lessons and are most valued. Photographs and other modes of data presentation are not greatly used, nor are they seen as of value.

3. THE DISCUSSION-INTERVIEW WITH TEACHER FOUR.

Prompted by the invitation to summarize his views on the role of text books in geography teaching, this teacher stated that his ideal text book for an examination class should contain all the factual content required for that examination together with a number of past questions to give practice in examination technique. The teacher's job was then defined in terms of helping pupils to understand the book and to appreciate the explanations given for the phenomena described. For younger pupils, this teacher looked for simple descriptive accounts on a range of topics "with lots of interesting photographs and diagrams and things to do". While the teacher might wish to select topics of interest either to himself or the class in the lower school, this teacher considered that the topics to be taught in the examination years should be "cut and dried".

This teacher introduced Wilson to the school some two years before the study took place, although he had used the book in a previous school. He regarded this book as the best book on the market for teaching the geography of the British Isles, mainly due to its attractive and colourful appearance which he felt created a positive attitude in pupils. However, he found that Young and Lowry was also needed to correct what was regarded as an overly systematic approach to the topic, which ignored the regional approach required for the examination. In addition to the two text books mentioned, the teacher also made frequent use of diagrams copied from other text books, but seldom or rarely used projected materials, resource packs or other published materials.

Teacher Four described his favoured style of teaching as follows: "The text book is the basis for my teaching. I go through a topic and talk to the class about it. They then read the book either in class or at home.Sometimes they read about the topic for homework before I talk about it. The maps and diagrams help them to understand both the text and the oral presentation - they are a kind of safety net for the teacher's description. The book is easy for them to read on their own as a basis for understanding but I then explain the reasons which explain things above and beyond the book." Later in the conversation, the teacher returned to this matter and suggested that "teacher plus text book equals understanding".

Although photographs were not a major contributor to this teacher's style, he did use slides when they were available in the school. He suggested that the class held photographs in relatively low esteem because they regarded what he, as teacher, had to say about the photographs as being of greater importance than the pictures themselves: "perhaps I'm too dogmatic in my explanations and I like talking". This approach was justified by the comment that "these kids are of very average ability. They want to be told the answers. They find thinking difficult".

The teacher described the two situations in which he might require pupils to read the text book for themselves. Firstly, they might be asked to go home and read the description of a topic already described in class. Secondly, they might be asked to read a part of the text book in preparation for the teacher to explain further. "The text book enables slower ability people to study at their own pace and maybe understand what they missed in class. The text book is a written account to reinforce the class lesson." The teacher did not consider that anything taught as part of the course was beyond the understanding of all his pupils, given time. Neither did he consider that reading difficulties were an impediment. "Reading is always accompanied by teaching, so the level of the text is not very important unless it is way out. I tell them not to go off to the library and try to read A-level text books otherwise they will just confuse themselves. Most kids can grasp the essentials and the teacher can help them later with difficult words, complex diagrams and things like that."

Of the photographs in the text books, Teacher Four had little to say. He admitted to preferring to use slides or film strips rather than the photographs in the books, but generally expressed a preference for diagrams, whether in a book or on film strip. "I don't talk about the photographs in the book, especially after the first year". When asked how pupils were prepared for the photograph interpretation questions which are a feature of most O-level and C.S.E. examination papers, the teacher affirmed that they were left to the revision period which preceded the examinations. "I hope that they will be able to apply their knowledge of geography to the photographs in an examination situation. I don't think that it is a skill which needs to be taught. Most of it is common sense". Was the space devoted to photographs in text books so much wasted space as far as this teacher was concerned? He replied quite firmly that he regarded photographs as an important part of the book, especially when in colour and of a reasonable size. "I think photographs in a book are attractive to pupils and might stimulate them to read the text". They did not apparently have any other educational value in the opinion of this teacher.

At the mention of maps Teacher Four expressed much greater interest. He regarded atlases as very important: "The most underused book in any geography room". He reported that the school had bought a new set of atlases recently and that they were regarded very favourably by pupils. One of the features of these atlases given particular mention by the teacher was the presence of photographs to show various landscapes. While not used in every lesson, the impression was given that atlases were in use in a large proportion of lessons, although the diary revealed that atlases were used only twice in the 28 sessions recorded. The specific use of the atlases was seen as being to show the location of features, particularly in relation to other features studied previously. Ordnance Survey maps were taught as a discrete topic "to give us all a break from the regional topics", but were not used as part of the study of specific areas of the British Isles. The thematic maps in the text books were regarded as being too complex for most pupils to appreciate, and accordingly they were rarely used. This was thought to be so both for Wilson and Dobson and Virgo. Weather maps in the books were used to train pupils in the recognition of specific features (depressions, anticyclones) but weather map interpretation and forecasting were considered as being too difficult for most of these pupils. Pupils were given duplicated outline maps on which they were encouraged to summarize the details of their regional studies.

Diagrams were also regarded as being of particular importance, especially for supplementing the text or teacher exposition and for clarifying or illustrating the features described. For this reason, copying diagrams was seen as being an important part of geography lessons. However, when asked if pupils were encouraged to draw their own diagrams to summarize information received in some other way, the teacher replied: "I have to play safe. They would muck it up on their own".

Graphs and tables of figures were seen as being of much less importance. "We look at the tables and graphs together and I explain them in simple language. Usually we wouldn't look at the figures until after I've taught the topic and then the graphs and figures provide the proof." The teacher did not think that graphs and tables needed to be used below the fourth year. To the suggestion that pupils could be asked to draw their own conclusions from graphs, he replied: "that's a bit basic isn't it?"

Teacher Four confirmed his pupils' view, expressed in their evaluation of the teaching strategies, that group discussion and geographical games (11 and 13) formed no part of his teaching style. However, he also indicated that he did not use strategies involving opinions and feelings (10 and 14). Other than this, the teacher's ranking of the remaining strategies and his pupils' ranking failed to correlate significantly. (Spearman's R = 0.58; an R of +/- 0.7 would indicate an acceptable correlation).

In examining the pupils' assessments of the value of the teaching strategies, Teacher Four suggested that they appreciated dictation as it was one way in which the text could be translated to their own level of language. However, one passage which had been dictated by the teacher was found to have a readability score on the Fry graph of two years higher than the corresponding passage in Wilson's book. When the similarly high valuation for text book questions and copying information, but a relatively low valuation for oral questioning, discussions, the giving of opinions or the revealing of feelings was pointed out, the teacher suggested that many of his pupils lacked confidence in their own abilities and preferred those strategies in which their weaknesses were least likely to be revealed publicly.

Teacher Four did not feel the need for questions or activities to be included in the text books used for examination classes: "I know what my classes need in their geography lessons. The author of a text book can't know the abilities of everyone who will use the book". To the suggestion that a text book could be written to meet the specific requirements of each examination syllabus, the teacher replied that such a book "would take out the hard graft from examination preparation. It would almost be cheating". He continued to ponder the idea of the course text and suggested that it could lower the need for teachers and would in any case interfere with the teacher's right to teach in his own style.

The view of this teacher that geography teaching consists essentially of the transmission of descriptions of the earth's surface together with some explanation was repeated in a number of ways, including: "geography is description followed by explanation, with the help of diagrams, maps and graphs." When asked about the effects of the examination system on his teaching, the teacher commented "I suppose that the exams are a constraint but I don't mind as I feel confident in what I'm doing." When asked what changes he would make in his teaching style and text book use if school based curriculum development and assessment were introduced, the teacher answered that he would choose different topics from some of the excellent text books available. In particular he would like to teach more about environmental problems as well as do more local field work. However, "I wouldn't change my teaching style unless I felt that I was not being successful. So long as they enjoy their geography lessons and choose geography in the fourth year options, I don't think I will change".

For this teacher, the text book would seem to be regarded as primarily an aide memoire for his own expositions to his class and as a reservoir of information from which his pupils may draw according to his instructions. While obviously reliant on the text book as the basis for his own teaching, and of the opinion that text books should be visually attractive for his pupils, this teacher appeared to regard his own role as being the main source of knowledge for his pupils. Text books were seen as being a way of meeting the individual needs of pupils.

V. TEACHER FIVE

Teacher Five was a non-graduate historian working in a co-educational comprehensive school in an outer London Borough. Her timetable consisted equally of geography and history to pupils in their first three years of secondary education. She had returned to teaching, after having children, five years before the period covered by the diary. Pupils in the school were divided at the end of their first term in the school into an upper and a lower band and, thereafter, into four sets within each band for each individual subject area. This teacher agreed to keep a diary of her lessons with the third set in the upper band of the third year.

1. CLASS 3

A. The structure and readability of the text books

Of the five books used with this class during the period of the diary, three: Oxford Geography Project 3 (Grenyer et al. Book 22), Basic Geography 3 (Greasley et al. Book 21) and Understanding Developing Places (Kimpton, Book 24), form part of series for lower school pupils, and are intended for third year pupils. The other two, Earthquakes (Macdonald Colour Unit, Book 6), and Different Worlds (Crisp, Book 13) are intended for fourth and fifth year pupils. Figures 58a to 58e summarize the analyses of these text books.

SUMMARY ANALYSIS OF BOOK 22: Grenyer et al. Oxford Geography Project 3

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	24	24	6	1	7	61
Textual references to illustrations: None:	-	46	38	25	0	43	40
In passing:	-	8	0	50	0	43	18
Detailed:	-	46	63	25	100	14	42
Percentage of illustrations used in Questions/Activities	-	46	88	50	100	100	58

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 41

	Non-experiential	Experiential
Percentage of all Questions/Activities	30	70
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	19	38
Integrating	50	57
Open ended	31	5
Valuing	0	0

Fig. 58a

SUMMARY ANALYSIS OF BOOK 21: Greasley et al. Basic Geography 3

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		38	16	17	22	1	6	62
Textual references to illustrations:	None:	-	91	75	60	50	50	73
	In passing:	-	9	0	20	50	50	17
	Detailed:	-	0	25	20	0	0	10
Percentage of illustrations used in Questions/Activities		-	64	100	80	100	50	77

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 45

		Non-experiential	Experiential
Percentage of all Questions/Activities		16	84
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	0	55
	Integrating	67	29
	Open ended	33	6
	Valuing	0	9

Fig. 58b

SUMMARY ANALYSIS OF BOOK 24: Kimpton Understanding Developing Places

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		54	21	4	15	0	6	46
Textual references to illustrations:	None:	-	25	0	0	-	50	22
	In passing:	-	21	0	22	-	0	18
	Detailed:	-	54	100	78	-	50	60
Percentage of illustrations used in Questions/Activities		-	75	50	67	-	100	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 34

		Non-experiential	Experiential
Percentage of all Questions/Activities		20	80
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	11	46
	Integrating	89	54
	Open ended	0	0
	Valuing	0	0

Fig. 58c

SUMMARY ANALYSIS OF BOOK 6: M.C.U. Earthquakes, Volcanoes and Mountains

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	21	15	24	0	0	61
Textual references to illustrations: None:	-	22	25	25	-	-	24
In passing:	-	56	50	13	-	-	38
Detailed:	-	22	25	63	-	-	38
Percentage of illustrations used in Questions/Activities	-	44	100	63	-	-	62

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 33

	Non-experiential	Experiential
Percentage of all Questions/Activities	6	94
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	72
Integrating	100	28
Open ended	0	0
Valuing	0	0

Fig. 58d

SUMMARY ANALYSIS OF BOOK 13: Crisp Different Worlds

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	27	24	10	37	0	3	73
Textual references to illustrations: None:	-	75	100	50	-	100	67
In passing:	-	25	0	50	-	0	33
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	25	100	63	-	100	60

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 47

	Non-experiential	Experiential
Percentage of all Questions/Activities	29	71
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	25	55
Integrating	38	40
Open ended	0	5
Valuing	38	0

Fig. 58e

Fig. 58. Summaries of the analyses of the text books used by Teacher Five with Class 3

Of the three books from lower school geography series, those by Greasley et al. and Grenyer et al. devote about one third of their print area to text with about two thirds to illustrations. Kimpton devotes slightly over half the print area to text. Of the illustrations in the books, Kimpton includes a predominance of photographs, Greasley et al. includes a predominance of diagrams and Grenyer et al. include equal print areas of photographs and maps. Maps are not a major feature of Kimpton, while none of the three books place great emphasis on graphs and tables. All the books make use of their illustrations as bases for questions and activities. Kimpton and Grenyer et al. give detailed help in the interpretation of their illustrations, while Greasley et al. refer to only a small proportion of illustrations in this way. All three books devote a substantial proportion of their text to questions and activities, and these are generally experiential. The majority of the experiential questions and activities require the integration of prior knowledge except in Greasley et al. where the most require confirmation. This book also includes a number of valuing questions. Of the non-experiential questions, the majority in all three books required integration of prior knowledge, although both Greasley et al. and Grenyer et al. include a number of open ended questions.

Of the two books which are intended for older pupils, both include a high proportion of illustrations, although graphs and tables are not highly represented. Neither book discusses a large proportion of the illustrations in detail. The Colour Unit devotes about a third of its text to questions and activities, and Crisp devotes nearly half the text to questions. Both books include a majority of experiential questions and activities. The experiential questions and activities in both the books are mainly confirming, but Crisp includes a higher proportion of integrating questions.

Appendix I shows that the three books intended for lower school use have higher readability scores than the two books intended for older, though lower ability, pupils. The mean chronological age of third year pupils is 13.11, and the range of mean readability scores for the five books is from 11 to 15.4. This suggests that the books are within the capacity of the pupils to use. Cloze tests suggest that these two books may be used at the instructional level with the class. Figures 59a and 59b show that in each case, few pupils are working at the frustration level while substantial proportions of the class scored at the independent level. There would therefore seem to be little reason why this class should not be able to work with the books available.

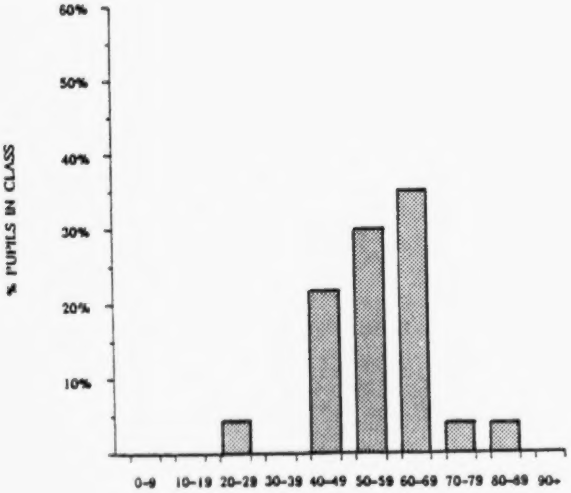


Fig.59a. The results of a cloze test on Book 22: Oxford Geography Project 3 with Class 3 of Teacher Five. Pupil N = 23; Deletion N = 49;Mean = 57%

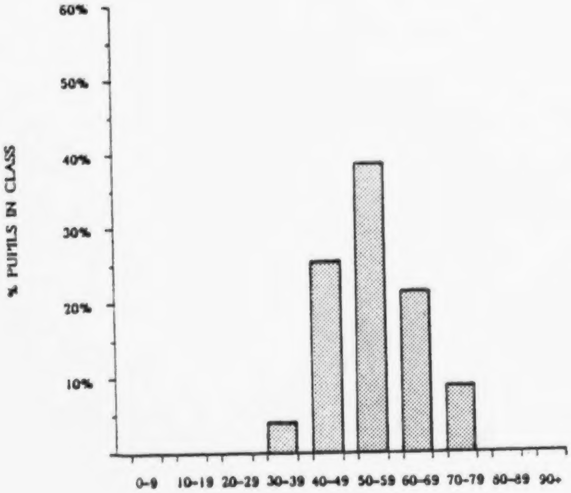


Fig.59b. The results of a cloze test on Book 24: Understanding Developing Places with Class 3 of Teacher Five. Pupil N = 23; Deletion N = 50; Mean = 55%

B. Record of lessons

a) The written diary

Figure 60 shows that text books played a major role in the geography teaching of Class 3 during this period. Of the sessions in which a text book was used, over half were based either entirely or closely on the structure of one or other of the text books (55%). The pupils did not study the text book alone other than to complete questions and exercises, but in over the half the sessions some part of a text book was copied: map, diagram, graph or table. Questions and activities from the text books were used extensively, being almost always completed orally in class with the teacher directing the discussion, and then being answered individually in writing by the pupils. The questions and activities were chosen mainly from Oxford Geography Project 3 and Basic Geography 3 (Books 22 and 21) and of all questions and activities, 70% were experiential, thus broadly reflecting the emphasis on experiential questions of the text books as a whole (Figure 84). The questions selected by Teacher Five included a high proportion of non-experiential integrating questions (73%) as well as a relatively high proportion of experiential confirming questions. This contrasted with the three text books which placed emphasis on experiential integrating questions. Furthermore, while Oxford Geography Project 3 included a considerable number of open ended questions and Different Worlds included a high proportion of valuing questions (Figure 58), this was not reflected in the questions selected by this teacher. This may indicate some tendency on the part of the teacher towards factual information and theoretical principles rather than towards the application of principles to the interpretation of resource materials, or to more open ended enquiry. The analysis also revealed that the skill of inferring was required in a majority of both confirming and integrating questions and activities.

SUMMARY OF DIARY OF TEACHER 5 :CLASS 3 :N.= 25

Volume of text book usage: No. of sessions recorded: 27 (40 school periods)
No. of sessions in which text books used: 24 : 89%

Text books used during period of diary (and no. of sessions used):
No.22: Grenyer, Oxford Geography Project 3 (10)
No.21: Greasley, Basic Geography 3(7) No.13: Crisp, Different Worlds (2)
No. 6: Clare,M.C.U. Earthquakes (2) No.24: Kimpton, Understanding Devel.(6)

Of the 24 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 1 (4%); made reference to elements of tb: 11 (41%); used tb as basis for exposition: 6 (22%); taught entirely from tb: 9 (33%);

No. of sessions in which elements received particular reference:
Text: 7 ; Photo: 3 ; Map: 5 ; Diagram: 5; Graph: 1 ; Table: 0 ;

Pupil activities: Pupils did not study the text book alone.

Pupils copied information from the text book during 15 sessions as follows:
Text: 0 Photo: 0 Map: 5 Diagram: 6 Graph: 5 Table: 1

Pupils' completion of Questions/Activities
There were a total of 88 Q/As. Of these 30% were Non-exper'l; 70% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
80(91%) orally; 88(100%) in writing (None of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk 22: 25 (28%); Bk 21: 34 (39%); Bk 24: 17 (19%); Bk 13 : 12 (14%)

Non-experiential questions (N = 26):
Rhetorical: 0%; Confirming: 15%; Integrating: 73%; Open Ended: 4%;Valuing: 8%

Experiential questions (N = 62):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	8	5	0	0	13
Comparing	6	5	2	0	13
Organizing	16	0	0	0	16
Experimenting	0	0	0	0	0
Inferring	26	24	6	2	58
Applying	0	0	0	0	0
TOTAL %	56	34	8	2	100

Experiential Q/As referred to data sources as follows (% references, N=40):
Atlas: 5%; Other text: 5%; Photo: 12%; Map: 30%;
Diagram: 30%; Graph: 3%; Table: 15% Reality: 0%

Origin of data sources referred to in Experiential Q/As:

%	Bk22	Bk21	Bk24	Bk13	Other
Photo	5	7	0	0	0
Map	15	5	10	0	5
Diag	7	15	5	3	0
Graph	0	0	0	3	0
Table	5	3	5	3	0
Other	0	0	5	0	0
TOTAL %	32	30	25	9	5

Fig. 60

C. The pupils' responses to their books and lessons

Figures 61a and 61b show the pupils' perceptions of two of the text books they used. The results suggest that while Oxford Geography Project 3 is seen as including a relatively high proportion of photographs and text, Basic Geography 3 is seen as including primarily text, photographs and maps.

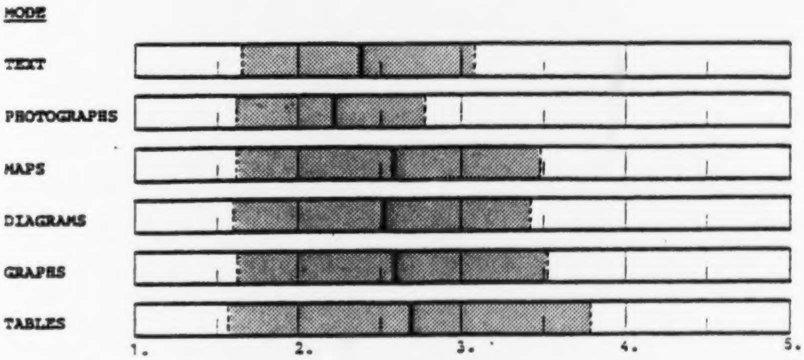


Fig. 61a. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 22 by the pupils of Teacher Five, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

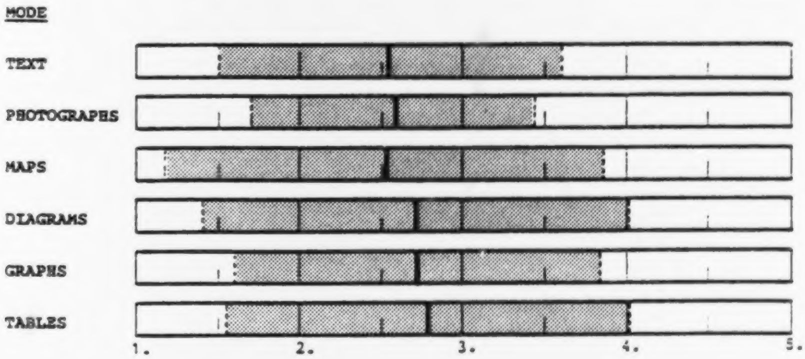


Fig. 61b. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 21 by the pupils of Teacher Five, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

This contrasts with the pupils' perceptions of the text book information presented to them in their geography lessons, shown in Figure 62, which suggested that diagrams, graphs and text were the most common resources used, while photographs, maps and tables were referred to rather less frequently. The pupils own assessment of the various modes of data presentation, shown in Figure 63, suggested that they regarded diagrams and photographs to be of greatest value, while text, maps, tables of figures and graphs were assessed as being of less value.

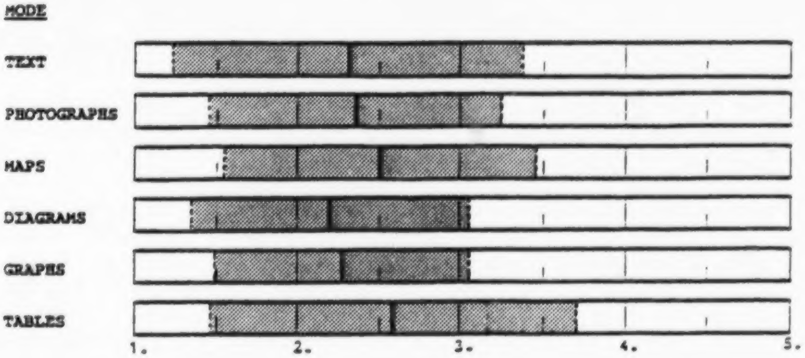


Fig. 62. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Five, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

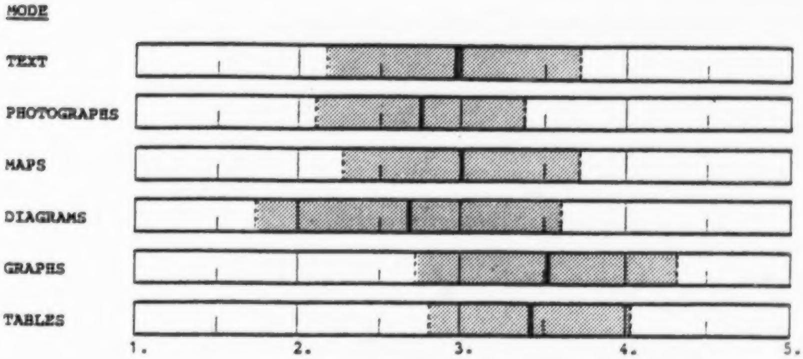


Fig. 63. Pupils' assessment of the six modes of data presentation: Teacher Five, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

The pupils' assessments of the various teaching strategies, shown in Figure 64, suggested that these pupils valued teacher directed discussion (9) completing activities from a text book and copying information (6 and 7) and listening to teacher explanations (1). On the other hand, writing their own explanations, studying a text book alone and dictation (8, 3 and 4) received lower valuations. Although not unanimous, many pupils had no recollection of engaging in group discussions, geographical gaming and work involving their feelings (11, 13 and 14).

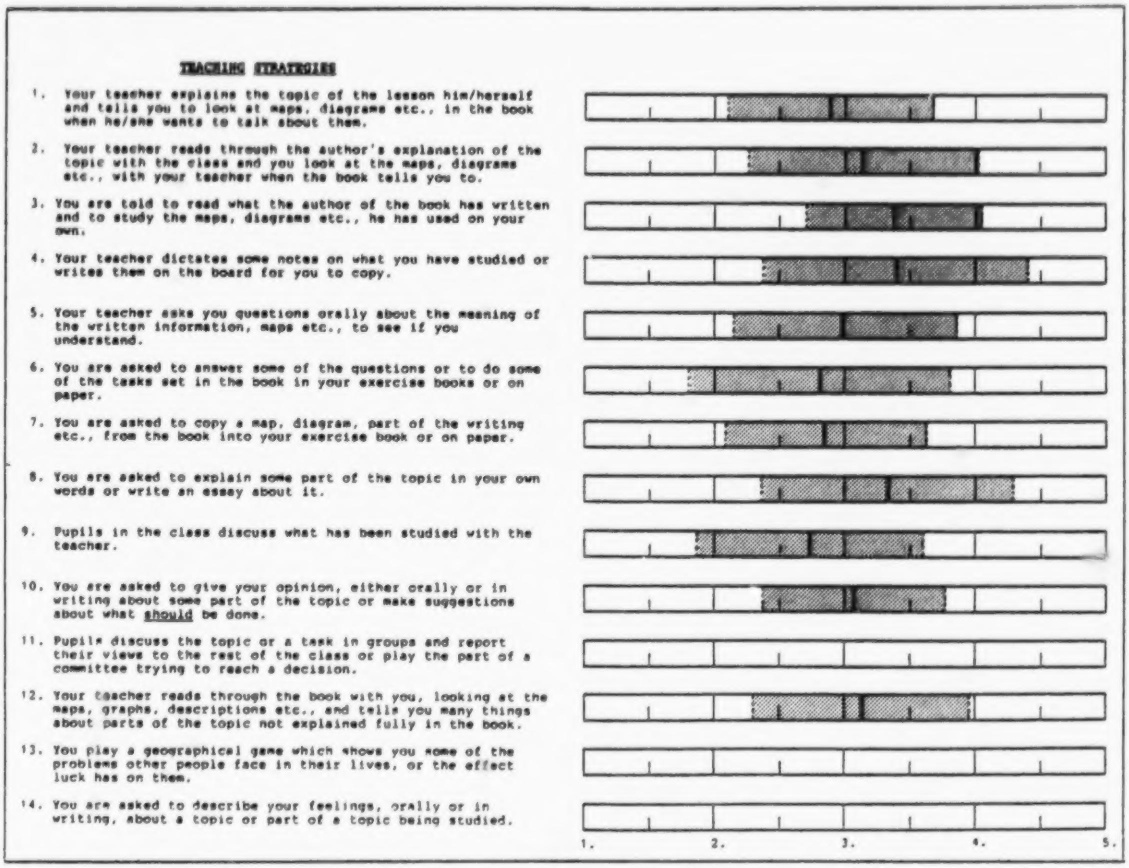


Fig. 64. Pupils' assessment of the fourteen teaching strategies

Teacher Five, Class 3.

(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. SUMMARY OF THE TEACHING STYLE OF TEACHER FIVE BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Five relied heavily on text books in her teaching. Despite the high proportion of experiential questions and activities in the text books available to her, she tended to select non-experiential questions. These were usually answered orally in class before the pupils wrote answers in their exercise books. Her pupils copied information from the text book frequently, but during the period of the diary, were never asked to read it alone. While the pupils regarded the text books to include a high proportion of photographs, these were not perceived to be used greatly in class. Diagrams and graphs were seen as being used most of all but the pupils placed greatest value on diagrams and photographs. They did not assess the text or maps highly in terms of value for their learning.

3. THE DISCUSSION-INTERVIEW WITH TEACHER FIVE

Teacher Five was most anxious during our discussion to emphasise from the very beginning that she was not a trained geographer, and accordingly placed greater emphasis on the use of a text book than she felt she should. She suggested that in history, the subject in which she was primarily trained, her use of a text book would be much less. This suggested that she regarded the transmission of information to be her primary aim in teaching.

This teacher explained that the syllabus as laid down by the Head of the Department, for the year during which the diary was kept, was defined as being the topics included in Understanding Developing Places. The other text books were available for use at the discretion of individual teachers. This teacher therefore regarded Understanding Developing Places as providing a source of topics to be studied, while the other text books were seen as sources of individual resources and sources of exercises. Having selected a topic, she explained that she then tried to select the means from any or several of the books most appropriate to the class. Despite the availability of a range of text books, the teacher said she felt inadequately prepared. "I am learning as I go along. We are left to our own devices. We can do as we like with our classes: I don't really know what line to take."

The written text was seen primarily as a resource for the teacher. The teacher explained that she taught from the text book and elaborated on either the text or illustrations when she felt confident. Although she did ask pupils to read from the text on their own, this was a rare occurrence. Pupils' reading alone from the text was most frequently associated with teacher tiredness or absence, or as an extra source of information after the teacher had explained the topic. The explanation for this pattern of pupil reading did not lie in any perceived difficulties for pupils in reading since the teacher regarded the text as being within their reading ability. She doubted their ability to learn the skills of making inferences and criticism without teacher help. While agreeing that geography had a role to play in encouraging pupils' reading ability, this teacher considered that supervised reading was an important way of achieving this goal.

Photographs were considered as being of particular importance in geography teaching, and especially for less able pupils, as such pupils "find it difficult to gain a mental picture and need prompting". The view was expressed that less able pupils frequently responded to photographs more willingly that pupils of higher ability: "Our A-band pupils are worried about venturing opinions which may be 'wrong'. They are trying to establish themselves as academic. The less able will have a go. They can compare the situations in the pictures with their own lives and feel lucky".

Photographs from text books were mainly regarded as illustrating features previously described verbally. Pupils were frequently requested to collect photographs from newspapers relevant to particular topics (such as famine in Ethiopia, a flood or a volcanic eruption) and these then became the bases of classroom discussions on the conditions which had led to the dramatic situations usually portrayed in such photographs. The teacher also suggested that photographs were frequently used for written work, pupils being asked to describe and account for the situation portrayed in newspaper photographs. This aspect of her work was not reflected in the diary nor in the pupils' responses either in terms of perception or assessment. The explanation for this apparent disparity may have been revealed when the teacher suggested that the most common use of photographs in her lessons was when she said "here is an example of what we have been talking about".

The teacher confirmed the situation suggested by the diary that she rarely used the questions and activities based on photographs included in the books. The teacher regarded these as often being trivial while at the same time being obscure due to a lack of guidance as to what was required. She explained that pupils of all abilities might extract a great deal of information from a photograph, but only when guided through it step by step. She felt that the questions and activities in the text book failed to provide this kind of guidance. Similarly, while the photographs in the books were frequently discussed in some detail in the text, the teacher commented that when this description was not in close proximity to the photograph to which it referred less able pupils in particular experienced great difficulties.

Teacher Five felt that maps were an important part of geographical education. The school atlases were old and were used relatively rarely. The only source of large scale maps available was a set of Wilson's The Language of Maps which was used specifically to teach map work skills at the end of the summer term of the third year. The teacher suggested that pupils were frequently "suspicious" of atlas maps, suspecting them to be very complex, but had found that, with teacher assistance, pupils enjoyed using them. She found the thematic maps in the text books particularly helpful as she felt that they illustrated a limited aspect of the topic. With such maps, she asked the pupils to describe the patterns shown, and then discussed possible explanations for the distributions. The diary confirmed that text book maps formed a major part of the resources used by this teacher.

Diagrams were perceived as being used relatively frequently in geography lessons and were valued relatively highly by pupils, while the diary of lessons confirmed their importance. This teacher explained that diagrams acted as reminders for the teacher and summaries for the pupils. She considered that a diagram could make an ideal stimulus for a lesson and that after the teacher and class had "discussed" the relationships portrayed, the pupils could copy the diagram or describe it verbally. She explained that the more complex the diagram, the greater the need for class and teacher to talk about it. Thus diagrams were often seen as teacher's resources rather than pupils' resources. The diary revealed that 30% of the references to resource materials in the experiential questions and activities chosen by the teacher were to diagrams. This was a higher proportion than that which occurred in the text books taken as a whole.

The teacher acknowledged that ability to make use of statistics was an important skill which should be taught, but suggested that there might be other more important aspects which should receive greater attention. She added that: "My trouble is that I've never taught geography to older pupils, so I don't know when statistics are most appropriately taught. I do know that with these children, they find it very difficult. I tend to spoonfeed them when we come across tables of figures or graphs. Really they are just a backup to what has been said." Written work based on any form of statistics was often found to fail: "If they are to make any progress, they need a lot of help. On their own they are lost." The reason for this perceived inability was suggested as stemming from elsewhere: "our pupils are not used to making decisions or working alone or giving opinions. That kind of thing should be developed in the primary school".

The teacher ranked the fourteen strategies in terms of her own perception of their importance in her teaching. When tested against the assessments of her pupils, there was little correlation (R = -0.16). In discussing the pupils' rankings, the teacher was surprised that her pupils had excluded those strategies which referred to group discussions, geographical games and the affective domain (11, 13 and 14) from those which they recognized as forming part of geography lessons. However, even with the effect of these strategies removed from the calculations, the correlation remained low (R = 0.43). This suggests that the teacher's choice of teaching strategies was not reflected in her pupils' assessment.

On reflection, the teacher agreed that the three strategies denied by the class had probably not formed part of her teaching style with these children, although she repeated that they did form part of her repertoire with more able pupils. In response to the finding that her pupils gave their most favourable assessment to teacher explanation based on a book, oral questioning, copying and discussion with the teacher (5, 6, 7 and 9) she suggested that the pupils liked both the discipline and the security provided by the teacher: "They don't value their own thoughts; they like frequent reassurance from the teacher". Writing their own accounts, reading a book alone, and receiving dictation (8, 3 and 4) were least valued and prompted the teacher to wonder: "Why do they value teacher-reliant strategies so highly? I am rather worried about the way these pupils see their lessons".

The teacher claimed that the questions or activities presented in the text books were not a major part of her teaching strategy, although compared with other teachers, her use of such questions appeared to be high. She added that "the more I use a text book, the less I use the questions". The teacher commented that many text book questions needed adapting for classroom use either because they required specific prior knowledge beyond that possessed by many pupils, or because they took far longer to complete than any learning increment which might be expected, would justify. She went on to suggest that many text books had very few comprehension questions and that this was something which should be remedied. When asked to describe her view of good activities to include in text books, she replied that they should involve using skills in order to reach understanding, but her replies suggested that she included much factual knowledge in "understanding".

Teacher Five expressed a preference for using a variety of text books and was not enthusiastic about the idea of following a single text book course. When asked whether her pupils encountered any difficulties as a result of the different conventions adopted in the various text books, she replied that this was not a problem as "the teacher leads the pupils through the topic. The book is a mine of resources. Development of ideas through a book is unnecessary because it is the teacher who decides how the resources in the book are to be used".

When asked to describe the features of a good text book, Teacher Five replied that she had three main requirements: an appropriate level of language difficulty for the pupils who would be using it; a wide range of graphics; and a selection of exercises which could be completed easily by the pupils. In view of her previous comments on the role of the text and pupils' reading, the reference to language difficulty appeared to be inconsistent, but the teacher explained that easier reading levels would permit pupils to use the books alone for homework and for extension activities in class.

The teacher said that the syllabus made no mention of the skills of geography and that although she regarded them as very important, she wondered whether she taught them effectively. She felt that learning through the application of skills to data should play a greater part in the education of brighter pupils, but that with less able pupils, the transmission of "facts" was of greatest importance. She considered that the text book controlled the way in which the skills of geography were taught. It would appear from a comparison of the diary with the analyses of the text books presented in Figure 58 that Teacher Five made rather less use of experiential questions and activities than might have been expected.

She commented that the internal examinations constrained her teaching but that since they were set relatively early in the term, there was a long period of time left after the examinations in which the teacher could concentrate on more skills-based work. The discussion took place during the summer term after the examination period, and the teacher concluded by saying that "lessons are more pleasant now that the facts don't have to be rammed in. The kids are showing more interest in their geography lessons now."

For Teacher Five, text books are obviously of considerable importance, but despite her lack of confidence in her own knowledge of geography, it would appear that the teacher still feels that she should moderate the skills-based, experiential approach of the text books at her disposal in favour of offering her pupils close guidance in factual learning and help in interpreting graphic information. Nevertheless, the range of information-presentation methods and questions and activities experienced by the pupils of this teacher was relatively wide and the influence of the text books in terms of content and skill development appeared to be strong.

VI. TEACHER SIX

Teacher Six, a non-graduate trained in geography, had been teaching in her present girls' secondary school for eight years and held a post of pastoral responsibility for a year group. This was the only school in which she had taught. She agreed to keep a diary of a second and a third year class in this streamed school, and selected a lower stream second year class and an upper stream third year class.

1. CLASS 2

A. The structure and analysis of the text books

With Class 2, the only text book used during the period of the diary was Under the Southern Cross (Redmore, Book 43) in which the author stated in his Foreword that "This volume is intended for the average secondary school pupil in his second year". Figure 65 summarizes the analysis of this book.

SUMMARY ANALYSIS OF BOOK 43: Redmore Under the Southern Cross

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	61	23	8	7	0	1	39
Textual references to illustrations: None:	-	45	50	13	-	100	42
In passing:	-	9	0	13	-	0	8
Detailed:	-	45	50	75	-	0	50
Percentage of illustrations used in Questions/Activities	-	64	0	25	-	100	50

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	22	78
Percentage of each type of Question/Activity		
Rhetorical	8	-
Confirming	0	68
Integrating	77	30
Open ended	15	2
Valuing	0	0

Fig. 65. Summary of the analysis of the text book used by Teacher Six with Class 2

This book devotes almost two thirds of its print area to text, while most of the illustrations consist of photographs. A quarter of the text of the book is devoted to questions and activities, most of which are experiential. Half of the illustrations are used as the bases for questions and activities. While the experiential questions and activities are predominantly confirming, the majority of non-experiential questions and activities are integrating.

Appendix I suggests that this book has a readability level of 14.3 on the Flesch scale and 14 on the Fry graph, about one year higher than the 12.11 mean chronological age of Class 2. The mean cloze score on a fifty element test was 36% suggesting that the class was operating at the frustration level, while the distribution of the scores, shown in Figure 66 shows that only 28% of the pupils were able to use the book at the instructional level.

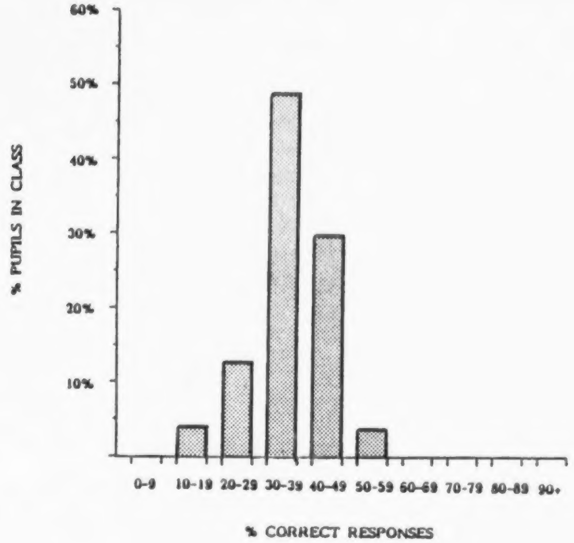


Fig. 66. The results of a cloze test on Book 43: Under the Southern Cross with Class 2 of Teacher Six. Pupil N = 33; Deletion N = 50;Mean = 36%

B. Record of lessons

a) The written diary

Figure 67 is a summary of the diary of Teacher Six with Class 2. When a text book was used, the teacher frequently taught closely from the book. Other lessons were taught from an atlas and film strips. Pupils studied the book alone on three occasions, after the teacher had read the text with them. Photographs, maps and diagrams were the main items copied from the text book.

The questions and activities included by the author were rarely used, most of those recorded in the diary being set during a single session. These questions were all non-experiential and required confirmation by the pupils. The questions were first answered by the class orally in response to teacher prompting, and then the pupils were required to write answers in their exercise books. During all other sessions, the class was instructed to write brief accounts of the subject matter of the lesson.

SUMMARY OF DIARY OF TEACHER 6 :CLASS 2 :N.= 25

Volume of text book usage: No. of sessions recorded: 24(24 school periods)
No. of sessions in which text books used: 15: 65%

Text books used during period of diary (and no. of sessions used):
No. 43: Redmore; Under the Southern Cross. (15)

Of the 15 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 1 (7%); made reference to elements of tb: 4 (27%);
used tb as basis for exposition: 2 (13%); taught entirely from tb: 8 (53%);

No. of sessions in which elements received particular reference:
Text: 2; Photo: 2; Map: 3 ; Diagram: 3; Graph: 0 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 3 sessions.
Of these, all were after teacher explanation.

Pupils copied information from the text book during 6 sessions as follows:
Text: 1 Photo: 3 Map: 2 Diagram: 2 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There were a total of 6 Q/As. These were non-experiential and required confirmation only. The teacher first used the questions orally with the class and then the class was instructed to write answers to the questions. All other written work consisted of pupils writing notes about the topics covered in class.

Fig. 67

C. The pupils' responses to their books and lessons

Pupils in Class 2 perceived Under the Southern Cross as including a high proportion of text, rather fewer maps, diagrams and photographs and very few graphs and tables (Figure 68). This contrasted with the measured proportions of print area (Figure 65) which shows that while maps and diagrams together occupy 15% of the total print area, photographs occupy 23%. While their perception of the use made of these presentation modes in their geography lessons indicated the same rank order, the differences between the relative levels of use made of photographs, maps and diagrams were not so great. Graphs and tables were perceived as being used very infrequently (Figure 69). When these perceptions were related to the pupils' assessments of the various modes, text, diagrams, maps and photographs received scores within a range of 0.2 on the scales used, suggesting that the pupils did not differentiate strongly between them, while graphs and tables were rated as of lower value (Figure 70).

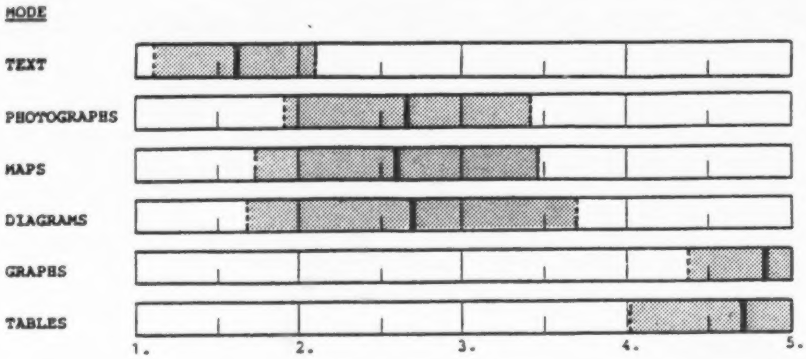


Fig. 68. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 43 by the pupils of Teacher Six, Class 2. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

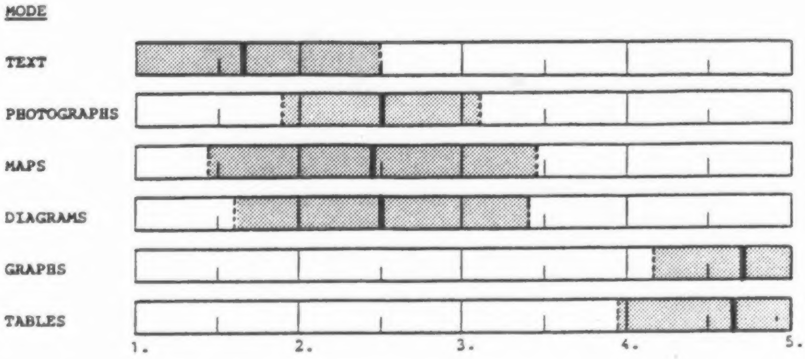


Fig. 69. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Six, Class 2 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

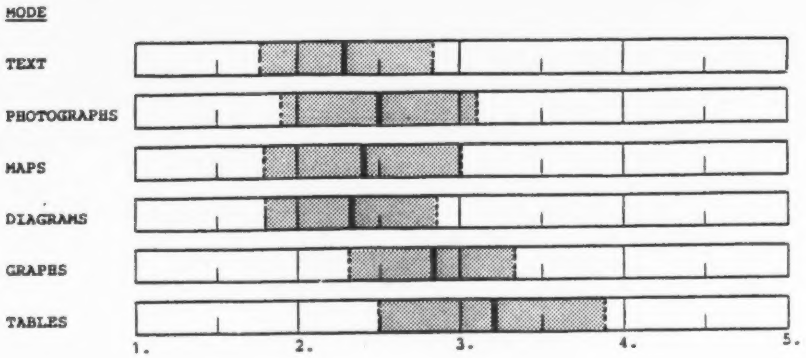
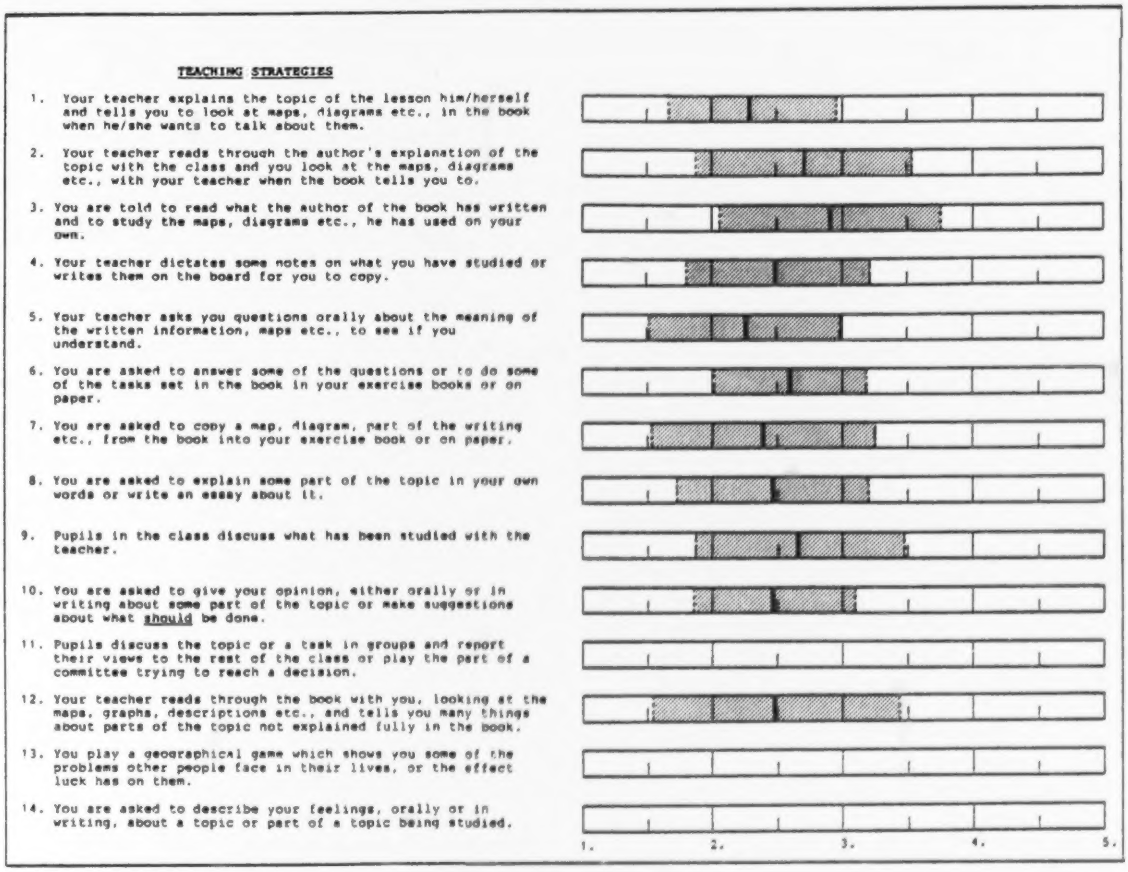


Fig. 70. Pupils' assessment of the six modes of data presentation: Teacher Six, Class 2

(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

In assessing the fourteen teaching strategies, Class 2 pupils recorded relatively high valuations for oral questioning by the teacher, teacher explanations based on specific parts of a text book and copying from a text book (5, 1 and 7), while lower valuations were recorded for reading through a book with the teacher, class discussion and pupils studying the text book on their own (2, 9 and 3). Class 2 pupils could not recollect experiencing group discussions, geographical games or lessons in which feelings were considered (11, 13 and 14). These assessments are summarized in Figure 71.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 71. Pupils' assessment of the fourteen teaching strategies Teacher Six, Class 2.

(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 3

A. The structure and readability of the text books

With Class 3, Geographical Studies in Western Europe (Randle, Book 42) was used. This book is intended "for use with pupils taking public examinations at fifteen or sixteen". Figure 72 is a summary of the analysis of this book. It shows that just over half the print area of the book is devoted to illustrations, most of which are maps. Few of the illustrations are described in detail in the text, but three quarters are used as the bases for questions and exercises. The overall proportion of illustrations used in this way is reduced by the low proportion of photographs referred to in questions. About one third of the text is devoted to questions and activities, and the majority of these are non-experiential. The proportions of experiential and non-experiential questions and activities demanding different levels of cognitive activity are similar, with a majority requiring the integration of prior knowledge.

SUMMARY ANALYSIS OF BOOK 42: Randle Geographical Studies in Western Europe

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	8	39	3	0	2	53
Textual references to illustrations: None:	-	40	88	100	-	100	80
In passing:	-	60	13	0	-	0	20
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	20	88	100	-	100	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 32

	Non-experiential	Experiential
Percentage of all Questions/Activities	52	48
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	36	41
Integrating	54	48
Open ended	10	11
Valuing	0	0

Fig. 72. Summary of the analyses of Book 42 used by Teacher Six with Class 3

Appendix I confirms that the readability level of the book is appropriate for the target audience, although the Flesch measure suggests that some passages have readability levels of up to 17.8. Figure 73 shows that the class achieved a mean score on a cloze test of 38%, suggesting that the class as a whole was operating at the frustration level, and that only a third could use the book even with help.

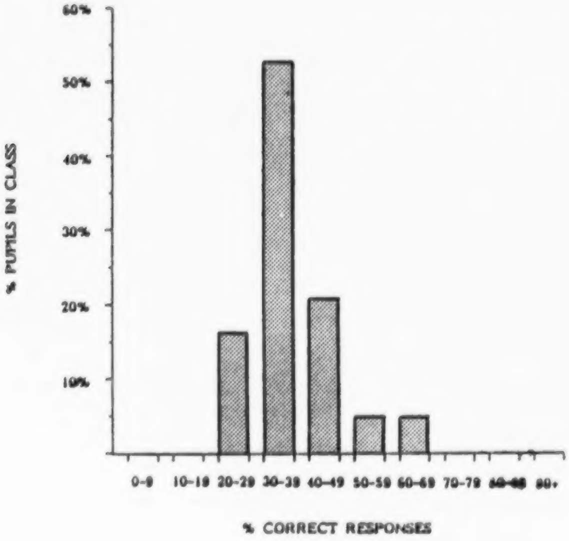


Fig. 73. The results of a cloze test on Book 42: Geographical Studies in Western Europe with Class 3 of Teacher Six. Pupil N = 19; Deletion N = 50; Mean = 38%

B. Record of lessons

a) The written diary

Figure 74 is a summary of the diary of Teacher Six with Class 3. It shows that the text book was used during most of the sessions recorded in the diary (79%). The text book was used by the teacher for reference to its text and illustrations, and as the basis of the teacher's own exposition, mainly as the prime source of information. Maps formed the main mode illustration used. On the rare occasions when the pupils studied the book alone, they usually did so after the teacher had explained the topic. Pupils were asked to copy information from the text book, particularly sketching from photographs and direct copying of maps and diagrams. The teacher did not require the pupils to complete any questions or activities suggested by the author, neither did she set any written questions herself. Written work was included in each session and involved pupils in writing descriptive paragraphs about the subject matter of the lesson.

SUMMARY OF DIARY OF TEACHER 6 :CLASS 3 :N.= 27

Volume of text book usage: No. of sessions recorded: 24 (24 school periods)
No. of sessions in which text books used: 19: 79%

Text books used during period of diary (and no. of sessions used):
No.42: Randle; Geographical Studies in Western Europe (19)

Of the 19 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 1 (5%); made reference to elements of tb: 5 (26%);
used tb as basis for exposition: 6 (32%); taught entirely from tb: 7 (37%);

No. of sessions in which elements received particular reference:
Text: 1; Photo: 2 ; Map: 5 ; Diagram: 3; Graph: 4 ; Table: 0 ;

Pupil activities: Pupils studied the text book alone during 4 sessions.
Of these, 1 was before and 3 were after teacher explanation.

Pupils copied information from the text book during 6 sessions as follows:
Text: 0 Photo: 3 Map: 3 Diagram: 2 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There were no questions or activities from the text book used

Fig. 74

C. Pupil responses to their books and lessons

Class 3 pupils perceived Geographical Studies in Western Europe (Randle, Book 42) as consisting predominantly of text, with maps and graphs as the second most frequent modes of data presentation. Diagrams were seen as being marginally more common than tables, while photographs were seen as least common (Figure 75). This perception did not agree with the measured proportions of print area (Figure 72) which showed that text and maps together comprised 86% of the total book, while photographs contributed 8% and diagrams, 3%. Graphs and tables occupied only small percentages of the print area.

The perception of these pupils of the relative proportions of use of the various modes was similar to their perception of the book itself. Text and maps were seen as being used most frequently, while diagrams and graphs were used less frequently. Photographs were perceived as being used infrequently (Figure 76). The pupils accorded their highest valuation to map usage, followed by text, diagrams and photographs (Figure 77)

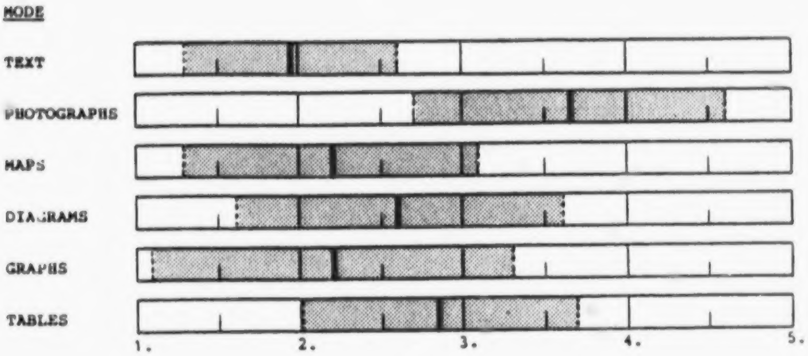


Fig. 75. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 42 by the pupils of Teacher Six, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

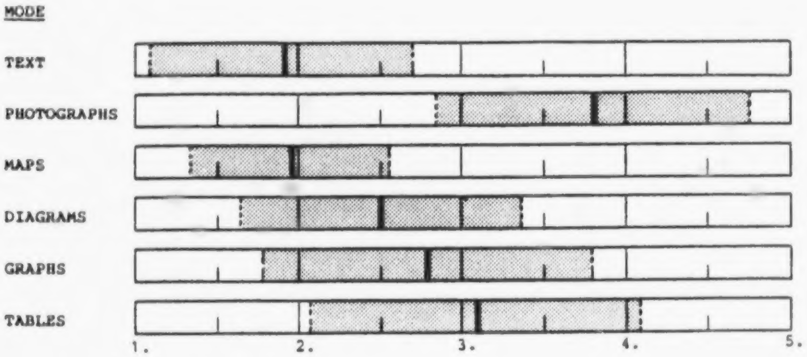


Fig. 76. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Six, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

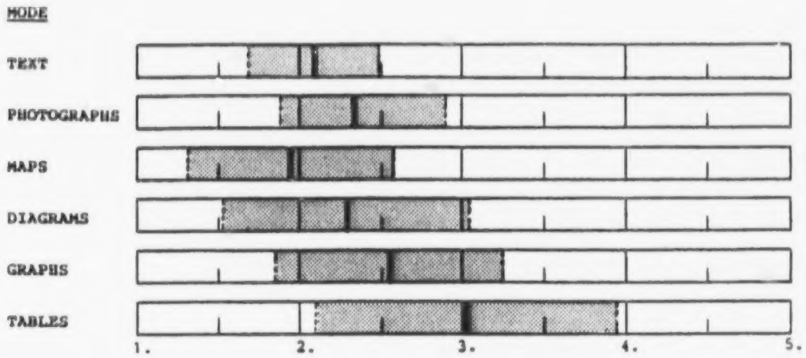
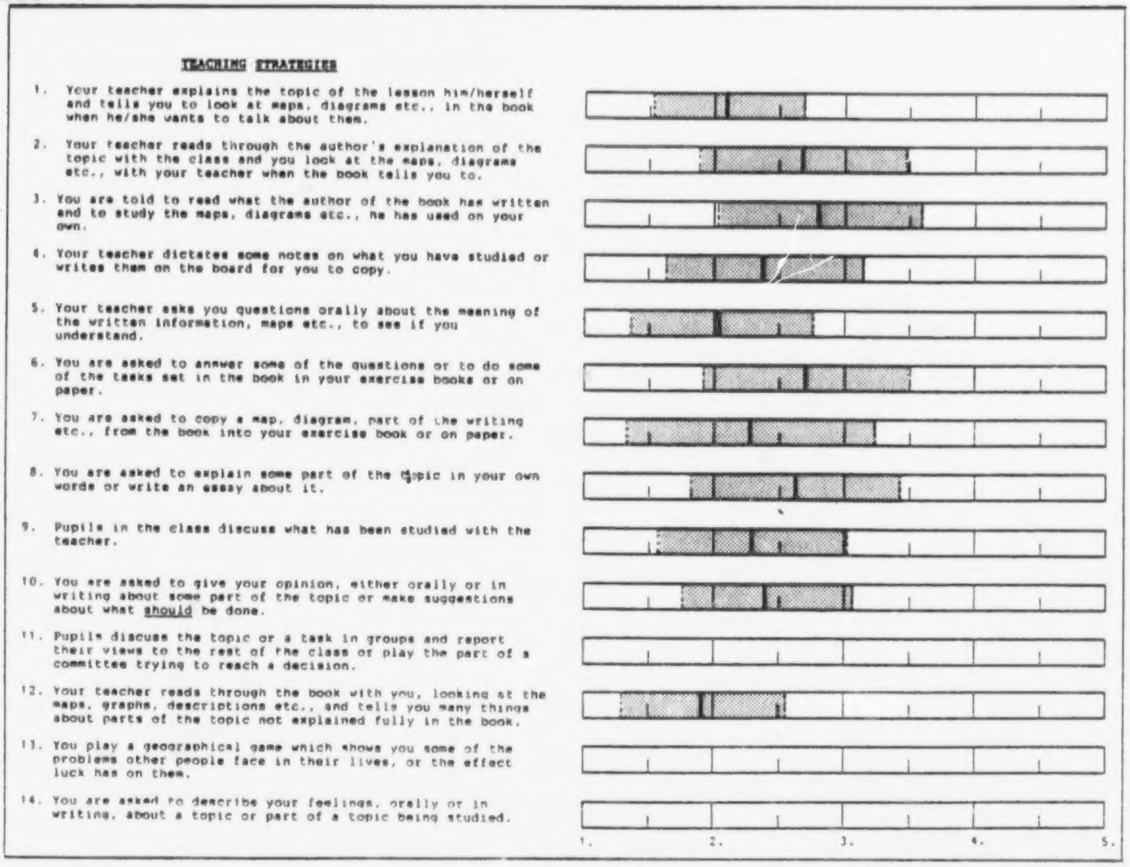


Fig. 77. Pupils' assessment of the six modes of data presentation: Teacher Six, Class 3
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

In assessing the teaching strategies (Figure 78), these pupils were generally in close agreement with their Class 2 colleagues. Despite the high level of correlation between the two classes (R = 0.83), Class 3 placed much higher values on teacher explanation of the topics of the book and discussion with the teacher (12 and 9).

The role of the text book for these classes was as a repository of descriptions of various parts of the world, to be interpreted for the pupils by the teacher. The emphasis in lessons was on descriptions of landscapes and lifestyles as portrayed in the text of the book. No lesson was recorded on audio tape and so the nature of the oral questioning which may have occurred could not be analysed.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 78. Pupils' assessment of the fourteen teaching strategies Teacher Six, Class 3.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER SIX BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Six used a text book in many of her lessons, and frequently taught directly from the book. Pupils rarely used the book alone, but copying information was relatively common. The teacher used none of the questions and activities suggested by the authors of the books, although this may be explained by the fact that Southern Continents is now very dated and Randle is rather difficult for a third year class. The pupils of this teacher perceived text and maps to be the major sources of information in their lessons, while photographs were not perceived as being used frequently nor to be of great value.

4. THE DISCUSSION-INTERVIEW WITH TEACHER SIX

This teacher explained that she regarded text books primarily as sources of individual teaching resources on which she could draw in teaching the topics on the syllabus. While the syllabus for second year pupils was prepared specifically from Redmore's The Southern Continents, the planning of the third year syllabus preceded the acquisition by the school of Randle's Geographical Studies in Western Europe.

While both of her classes perceived written text to be the main teaching resource in geography lessons, and accorded text a high valuation, the diaries showed that pupils were only rarely instructed to read the book for themselves. The teacher explained this differently for each class. In the case of Class 3, she said that "Randle is short on descriptive passages. It is nearly all data response questions which we need to talk about in class before they do any written work". With Class 2, the teacher explained: "The text book is very limited and very outdated, so I don't let them read it alone. It is very racist. It treats the white man as boss and the black man as a second class citizen. I don't like that aspect so I read the book with them. That way I can give them a more up to date account. I don't like the book, but it is the set text book so I have to use it sometimes, I suppose. I prefer to use slides or banda sheets." The teacher stated that she regarded reading to be important as a skill to be developed in geography lessons. She thought that it gave pupils "an opportunity to develop their own views" and that "they should be able to go home and read about something, and develop their own ideas and bring them back into class to talk about them". The outdatedness of Redmore and the language difficulties experienced by pupils with Randle were cited as inhibiting factors. The teacher saw this as the inevitable result of the decisions made by the Head of Department and, however regrettable, beyond her control.

Photographs were described as being important in geography lessons "to help the class fit the overall picture together". The teacher claimed to use slides wherever possible, frequently those taken by herself on holidays. The teaching strategies included talking about the picture and "discussing" what lay outside the picture both spatially and temporally. Pupils were often asked to make annotated sketches of the scenes portrayed "so that they can record what they have seen". The teacher considered that guided study of photographs was very important to ensure that all major aspects were perceived by the pupils, but asked pupils to analyse a photograph alone when a photograph similar to one discussed in class occurred in a text book.

The teacher did not find the photographs provided in either of the two text books very helpful. In the case of Redmore, the photographs were considered to be indistinct and of marginal relevance to the topics: "We try to concentrate on the crops grown in different countries, and there are very few photographs where I can say 'Look. This is how coffee, or tea, or cocoa, are grown', or 'this is what the landscape in this area looks like'". Similarly the photographs in Randle were seen as not contributing to the understanding of the landscapes or processes being studied. The teacher also commented that: "Kids don't seem to like photographs. They often ask 'Are the photographs important? Do we have to look at them?'" When asked why pupils might react in this way, she replied "The photographs in Randle aren't very awe inspiring." She would have liked colour photographs of landscapes, processes or products which could be used to illustrate specific aspects of the topic, but although the conversation centred around the need for specific illustrations, the reference to "awe" suggests that the role of photographs for this teacher would include inspiration as well as illustration.

Teacher Six made no use of large scale topographical maps other than for specific examination training. By the time of the discussion, the school had recently acquired new sets of atlases which had been issued to both the classes included in this study. At the time the diary was being completed, there had been few atlases in the school, and their use was therefore limited. The teacher did consider that maps were an important aspect of geographical study and frequently drew thematic maps on the blackboard to be annotated as the lesson continued and then copied by the pupils as a summary of the topic. Although the maps in Redmore were considered to be very poor, and those in Randle were considered to be too detailed for the ability of the pupils in Class 3, the teacher frequently set written questions based on sketch maps. She found that while Class Two needed much teacher assistance in extracting information from a map, both classes enjoyed using maps. This view was supported by the pupils' assessment of map use (Figures 70 and 77).

Teacher Six regarded diagrams as being of importance in illustrating processes or relationships which were often difficult to explain verbally.

She considered that her teaching style frequently included the construction of diagrams on the blackboard as the lesson proceeded, while text book diagrams often provided a point of departure for classroom explanations. This may account for the low emphasis on the use of diagrams suggested by the diaries while the pupils considered that they were used often and had high value for learning. In summary, diagrams were considered to be important as aids to understanding and, when copied into the pupils' exercise books, as means of summarizing information for later recall.

The use of statistics, in the form of graphs and tables of figures, was regarded as an important part of geographical education by this teacher. She considered that any topic involving the use of figures was regarded by the pupils as mathematics and therefore divorced from geography. The teacher claimed to use both graphs and tables orally with her classes, although the frequency of use was decided by the frequency with which such resources were encountered in the text books. Redmore includes few statistics; Randle provides many. The finding that Class 3 perceived that graphs were more commonly used in their geography lessons, but that they valued them much less than photographs (Figures 70 and 77) could not be explained other than in terms of a general dislike for mathematics and pupils perception of geographical study as being primarily visually and orally descriptive.

When asked to rank the fourteen teaching strategies which had been presented to the pupils, the teacher and classes were in general agreement that class group work and geographical games (11 and 13) were not used: "I'm not up to date on things like that and I don't feel up to doing them". While the description of feelings (14) was excluded by both classes, it was included by the teacher who commented that: "We talk about environmental factors and how they affect our feelings; but we give our own opinions, not feelings. I prefer to stick to fairly unemotional responses". On the other hand, the teacher's exclusion of strategies which require pupils to work on their own from a text book, which both classes included but for which they expressed a relatively low valuation, was explained by the teacher in terms of the use of such strategies for lessons in the teacher's absence and for extension work for those who finished early.

Tests of correlation between the teacher's rankings of the strategies and pupils' valuations give a value for Spearman's R of 0.6 for Class 2, (below the 0.7 usually accepted as indicating a positive correlation), and 0.8 for Class 3.

The pupils of Class 2 differed from the teacher in their relatively high valuation of copying and explaining topics in their own words (7 and 8), both of which the teacher regarded as relatively minor parts of her overall teaching style. On the other hand, class discussion (9) was placed foremost by the teacher but was seen as of relatively low value by Class 2 pupils.

The pupils of Class 3 expressed relatively high valuations for copying and dictation (4 and 7) while the teacher regarded these as of relatively minor importance in her teaching style. On the other hand, the pupils of this class ranked class discussion (9) fifth for learning value, while the teacher ranked this strategy as foremost in her style of teaching. The teacher expressed surprise at the positive response accorded to dictation. "I don't like dictating notes and I shy away from it. We do have examinations set across all classes, and I have to cover four or five areas of work in the Autumn term so that they can all be examined after Christmas. I don't like teaching like that. I would prefer to write a few notes on the board to guide their own writing so that they can develop a style of their own." The high valuation accorded to teacher questioning and teacher explanation (1 and 5) was acknowledged as matching the teacher's own expectations. "I like teaching the lesson and then going round the class firing questions. They seem to enjoy that."

It was suggested that the diaries gave the impression that most of the geography work with these pupils was descriptive. The teacher replied that the diaries were not really representative. Apart from annotated sketches, the teacher felt she spent a lot of time with the class encouraging them to interpret data forms of all types, although she suggested that their written work was mainly a summary of the information extracted from data sources and discussed during the lesson.

Text book questions and activities played very small part in the teaching of this teacher; this was revealed in pupils' perception, diaries and the teacher's own ranking of strategies. "The level of the questions in most text books is too high for our pupils. Also, they (the questions) rarely correspond to what I want to do ... in terms of the content. Of what I think they ought to know rather than the activities they ought to do. I suppose really I should do both." The teacher expressed a wish that text books included more data response questions on the topics which she chose to do, especially related to photographs and maps. "I always feel that pupils should be interested in map work because I enjoy it." While expressing a desire for a text book with a wider range of questions and activities on the grounds that "it is good for pupils to learn to work alone", the teacher emphasized that she liked to develop her own style and feared that such a text book could "tie her down". "My style is a content presentation style of teaching. I like chalk and talk. The first half of all my lessons is talking, either directly or by questioning. The text book is really for my benefit. The teaching I do myself." She added: "If I could find a text book which fitted my course exactly, I would love it. It would cut my preparation time down, but I would still go off at a tangent. I wouldn't have liked the idea three or four years ago. Then I wanted to do everything myself".

Returning to the use of resources to teach pupils to extract information and handle data presented in a variety of forms, the teacher stated: "I don't spend as much time on it as I should, I have to make it up in the fourth and fifth years. I should or could do more to help them analyse and draw conclusions at an earlier age. Lack of resources is a major constraint. I don't have time to prepare lots of resources. I teach with what's available. The skills of geography are introduced when resources are available." She also added that the Head of Department specified the number of weeks to be allotted to the teaching of each area of the syllabus and examined the pupils in terms of content knowledge rather than in terms of skill acquisition.

In summary, Teacher Six would appear to be basically committed to a content transmission model of geography teaching, although with a willingness to use various modes of data presentation not only for illustration but as a means to encourage pupils to develop skills of information extraction and analysis. However, commitments outside the classroom and the school syllabus and examination system, have resulted in a dependency on text books which are inappropriate to both the pupils and the teacher's own beliefs about the nature of geographical education.

VII. TEACHER SEVEN

Teacher Seven was a geography graduate who had completed post graduate initial teacher education five years before the period covered by the diary for this study. This teacher was still in the school of his first appointment: an all boys secondary modern school in a south London suburb for boys in the lower seventy percent of the ability range according to a local selection procedure. The school policy was to divide the boys into an upper and a lower band based on primary school reports immediately on entry to the school, and for geography to be taught in mixed ability groups within the bands thereafter. The teacher agreed to keep a diary of his lessons with an upper ability first year class and an upper ability third year class.

CLASS 1

A. The structure and readability of the text book

With Class 1, the syllabus specified a study of Patterns in Geography One (Rice, Book 44), which is the first in a three book series designed for the first three years of secondary education. Figure 79 summarizes the analysis of this book.

SUMMARY ANALYSIS OF BOOK 44: Rice Patterns in Geography One

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	25	7	19	1	1	53
Textual references to illustrations: None:	-	38	75	67	100	100	55
In passing:	-	56	25	22	0	0	39
Detailed:	-	6	0	11	0	0	6
Percentage of illustrations used in Questions/Activities	-	94	100	100	100	100	97

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 65

	Non-experiential	Experiential
-ercentage of all Questions/Activities	19	81
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	72
Integrating	73	28
Open ended	27	0
Valuing	0	0

Fig. 79. Summary of the analysis of the Book 44 used by Teacher Seven with Class 1

Patterns in Geography One devotes the major part of its print area to illustrations, especially to photographs and diagrams. However, the book is intended to be accompanied by a pamphlet of worksheets which contains a high proportion of maps. Items in this pamphlet were not included in the text book analyses. While few of the illustrations are described in detail, a high proportion are used as bases for the questions and activities which occupy almost two thirds of the text. The majority of the questions and activities are experiential, and while most of the non-experiential questions and activities require integration of prior knowledge, most of the experiential questions and activities require pupils to confirm information provided in one mode of data presentation, in another mode.

Appendix I shows that this book has a level of readability of 12.3 on the Flesch scale and 12 on the Fry graph, with individual passages ranging from 9 to 13.7. Since pupils of first year secondary age have a mean chronological age of 11.11, these results would suggest that such pupils should have little difficulty with this text book. This is broadly confirmed by the results of a cloze test which revealed a class mean score of 48%, while the distribution of scores (Figure 80) shows that four fifths of the pupils can use the book at the instructional or independent level.

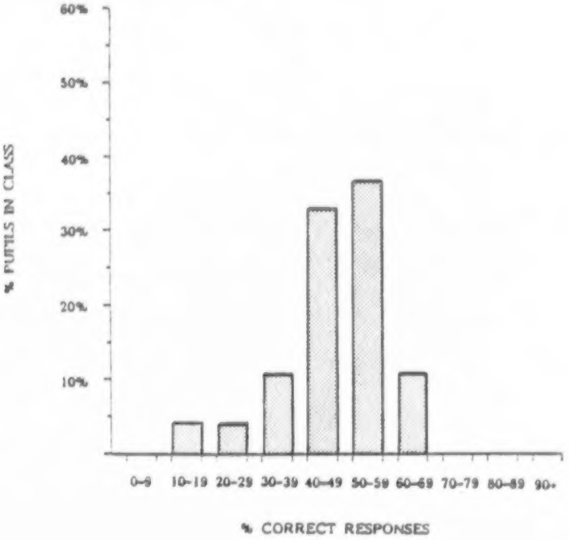


Fig. 80. The results of a cloze test on Book 44: Patterns in Geography One with Class 1 of Teacher Seven. Pupil N = 27; Deletion N = 63; Mean 48%

B. Record of lessons

a) The written diary

Figure 81 is a summary of the diary of the lessons of Teacher Seven with Class 1. During this period, 11 of the 14 sessions were taught using the text book. The teacher used the book primarily either as a source of resources or as a basis on which to develop the topic further himself. All the pupils' written work was selected from amongst the questions or activities from the text book, but a comparison of the analysis of the text book (Figure 79) and the activities selected by the teacher (Figure 81) suggested that the teacher chose experiential questions and activities in preference to those which were non-experiential. Of all the questions and activities from the text book completed by the pupils, only 27% were attempted in writing without first being discussed in detail orally with the guidance of the teacher. Furthermore, all the resources for these questions and activities were to be found within the text book.

b) Audio—recording of lessons

The teacher made an audio recording of the first ten to fifteen minutes of three separate sessions with Class 1 and one session with Class 3. In the first recording with Class 1, the teacher read through two pages of the text book which included text, a photograph and a map of a market garden, together with a number of questions. The questions were answered orally by the pupils and the teacher engaged in extensive analysis of the photograph and map with the class, based partly on questioning and partly on his own description. When the two pages had been covered in this way, the pupils were then instructed to complete all the questions and activities contained in the two pages in their exercise books. In the second of the three recordings, the class was instructed to read through the text book account of the formation of coal, to study the diagrams and photograph and to 'think about' the questions and activities suggested by the author. The teacher then went back over the two pages, reading the book account aloud to the class, questioning them to test their understanding of specific terms, phrases or processes and presenting his own explanation with the aid of blackboard diagrams when he discerned that some pupils had not understood the text book. The questions used by the teacher all required the pupils to integrate their previous knowledge into the topic. When the whole two page section of the book had been covered in this way, the pupils were again instructed to complete the questions and activities in their exercise books, working on their own and in silence. The third recording was of a lesson in which the teacher gave an explanation of the "problems of coal mining" based on a photograph of a gallery in a coal mine and a diagram which showed the effects of geological folding and faulting. During this exposition, the teacher asked few questions and made no reference to the text book explanation, although he emphasized the same points as the text book. At the end of the teacher's explanation, the pupils were again instructed to complete the text book activities on coal mining in their exercise books.

SUMMARY OF DIARY OF TEACHER 7 :CLASS 1 :N.= 32

Volume of text book usage: No. of sessions recorded: 14(20 school periods)
No. of sessions in which text books used: 11 :79%

Text books used during period of diary (and no. of sessions used):
No. 44: Rice; Patterns in Geography One (11);

Of the 11 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 0 (0%); made reference to elements of tb: 5 (45%);
used tb as basis for exposition: 5 (45%); taught entirely from tb: 1 (10%);

No. of sessions in which elements received particular reference:
Text: 3 ; Photo: 3 ; Map: 0 ; Diagram: 8 ; Graph: 0 ; Table: 2 ;

Pupil activities: Pupils studied the text book alone during 2 sessions
These were both after the teacher had explained the topic.
Pupils copied information from the text book during 5 sessions as follows:
Text: 2 Photo: 0 Map: 1 Diagram: 1 Graph: 0 Table: 1

Pupils' completion of Questions/Activities
There were a total of 35 Q/As. Of these 6% were Non-exper'l; 94% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
27 (77%) orally; 35 (100%) in writing (None of which were teacher-initiated)

Non-experiential questions (N = 2):
Rhetorical: 0%; Confirming:100%; Integrating: 0%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 33):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	3	15	3	0	21
Comparing	6	0	0	0	6
Organizing	15	0	0	0	15
Experimenting	0	0	0	0	0
Inferring	21	27	0	0	48
Applying	9	0	0	0	9
TOTAL %	55	42	3	0	100

Experiential Q/As referred to data sources as follows (% references, N=18):
Atlas: 0%; Other text: 0%; Photo: 39%; Map: 17%;
Diagram: 17%; Graph: 6%; Table: 11%

Origin of data sources referred to in Experiential Q/As:
All data sources were to be found in the text book

Fig. 81

The diary and audio recording of lessons of Teacher Seven working with Class 1 suggest that the teacher was concerned with developing the pupils' abilities to interpret the text and graphics of the book as well as to complete the questions and activities. The lessons appeared to be directed to assisting the pupils in working from the text book, providing background information where necessary, clarifying those aspects of the text book with which the pupils might find difficulty and attempting to ensure that they could complete the activities successfully. While there did not appear to be an emphasis on the learning of factual material, pupils did seem to be required to demonstrate their understanding of those aspects of each topic which were included in the text book and to manipulate information presented in text and graphic form. Thus, while the skills of integration and inference were given much prominence, the guidance given was such that pupils could circumvent the experiential nature of many of the questions.

C. Pupils' responses to their book and lessons

Figure 82 shows that the pupils of Class 1 perceive the text, diagrams and photographs to be the most common modes of information presentation in Patterns in Geography One, and Figure 83 confirms that their lessons follow the book closely by revealing a very similar response. In assessing the six modes of information presentation, the pupils responded most favourably to photographs, diagrams and maps, which suggests that they regard the text as less important than the explanations of the teacher (Figure 84).

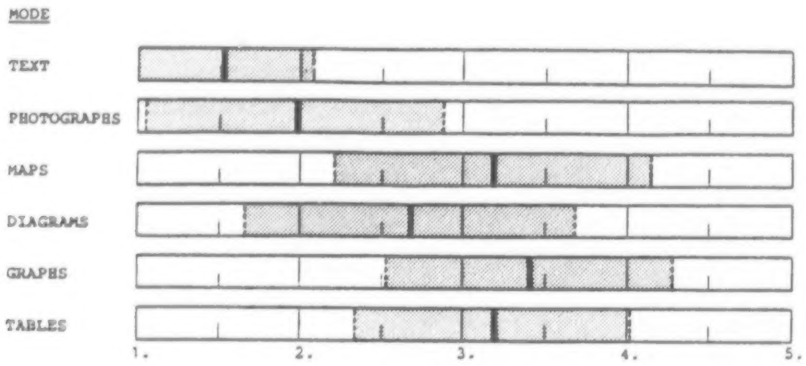


Fig. 82. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 44 by the pupils of Teacher Seven, Class 1. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

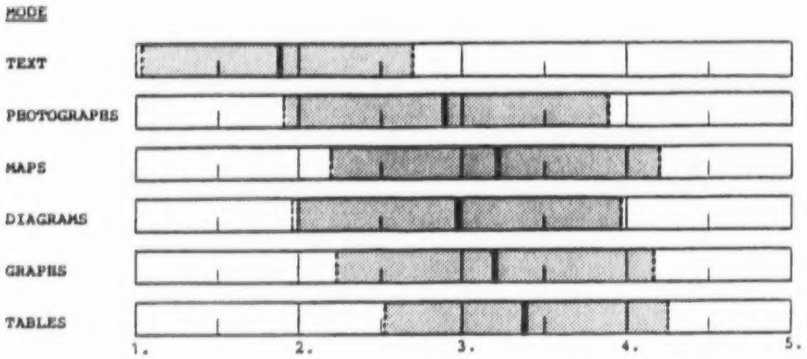


Fig. 83. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Seven, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

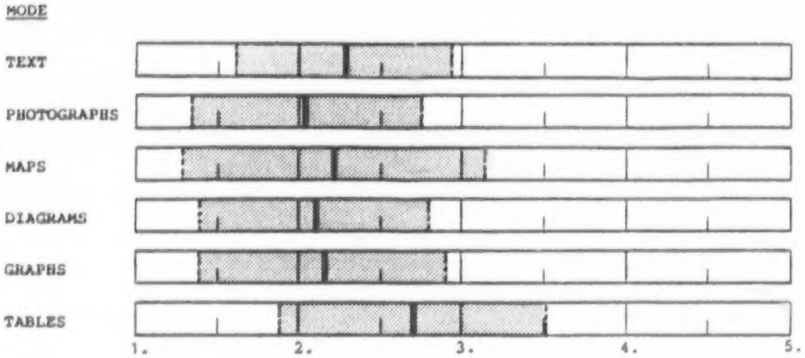
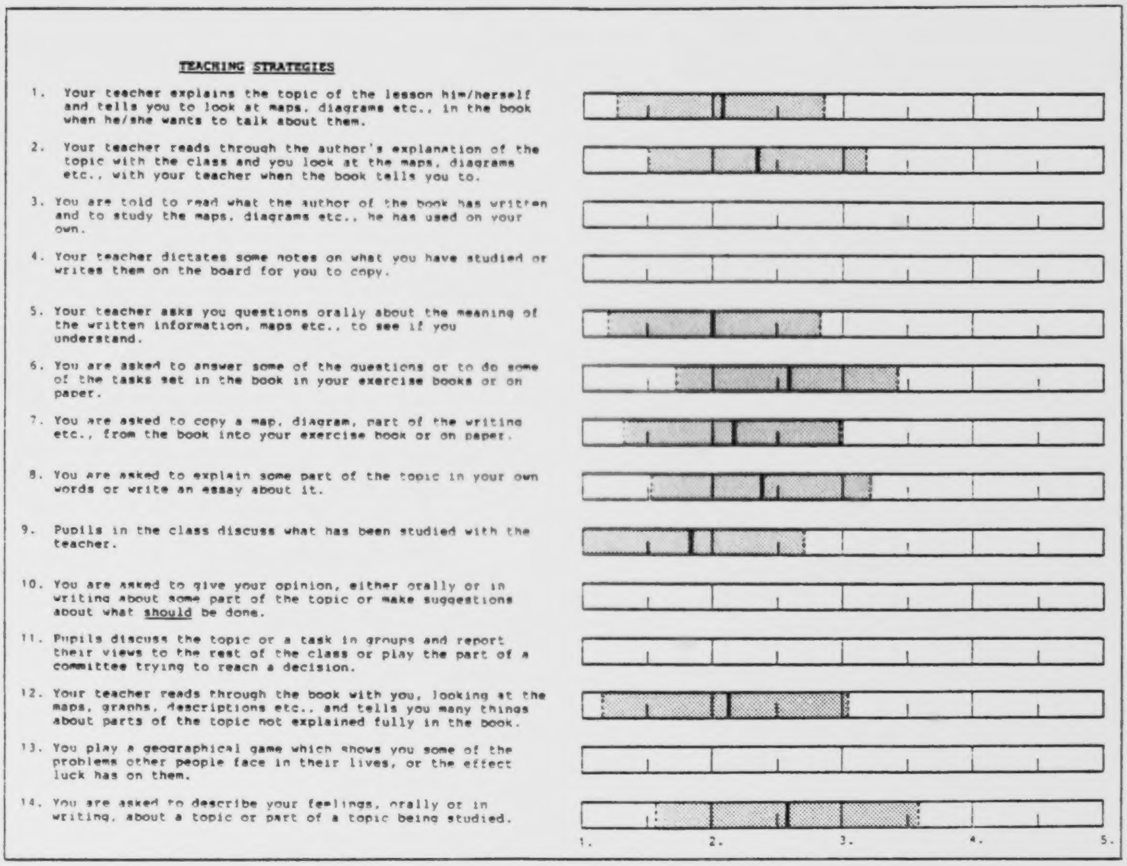


Fig. 84. Pupils' assessment of the six modes of data presentation: Teacher Seven, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

The view that the pupils regard illustrations most highly and text less so is supported by their assessment of the various teaching strategies (Figure 85) which shows that they value most highly those strategies in which they have the closest relationship with the teacher. Thus, class discussion, teacher oral questioning, teacher exposition and teacher reading of the text book with the class (9, 5, 1 and 12) are regarded most highly. They responded least favourably to answering questions from the text book (6).

The high level of teacher control was reflected by the pupils' denial of having experienced strategies which include working alone from the text book, giving opinions, and geographical games (3, 10, 11 and 13).



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 85. Pupils' assessment of the fourteen teaching strategies Teacher Seven, Class 1.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 3

It was school policy for pupils to be required to select those subjects to be followed in the fourth and fifth years to examination level towards the end of the third year. In order that pupils should make this decision on the basis of their attitude towards the subject and not towards a particular teacher, geography in the third year was taught as three major topics by each of three geography teachers for one term each. Accordingly, Teacher Seven taught a one term course on "Natural Disasters".

A. The structure and readability of the text books

During the period covered by the diary four text books were used. The two text books used most frequently were Spotlight on World Problems (Fawcett, Book 18) and Natural Disasters (Macdonald Colour Unit, Book 27). The analyses of these books are summarized in Figures 86a and 86b.

SUMMARY ANALYSIS OF BOOK 18: Fawcett Spotlight on World Problems

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	43	12	21	14	8	2	57
Textual references to illustrations: None:	-	67	71	75	100	50	74
In passing:	-	33	29	25	0	50	26
Detailed:	-	0	0	0	0	0	0
Percentage of illustrations used in Questions/Activities	-	33	86	25	100	100	68

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 40

	Non-experiential	Experiential
Percentage of all Questions/Activities	51	49
Percentage of each type of Question/Activity		
Rhetorical	37	-
Confirming	4	64
Integrating	52	27
Open ended	7	7
Valuing	0	2

Fig. 86a

SUMMARY ANALYSIS OF BOOK 27: M.C.U. Natural Disasters

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	37	36	17	4	0	6	63
Textual references to illustrations: None:	-	86	100	100	-	100	94
In passing:	-	14	0	0	-	0	6
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	14	25	0	-	0	12

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 6

	Non-experiential	Experiential
Percentage of all Questions/Activities	83	17
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	10	50
Integrating	80	50
Open ended	10	0
Valuing	0	0

Fig. 86b

Fig. 86. Summaries of the analyses of the text books used by Teacher Seven with Class 3

Although the introductions to both these books suggest that they are intended for public examination candidates in the fourth and fifth years, Appendix I shows that Spotlight on World Problems has a mean readability score of 14.37 on the Flesch scale and 13 on the Fry graph, while Natural Disasters was found to have a mean readability score or 13.06 on the Flesch scale and 12 on the Fry graph, with a range of from 11 to 14.4. It may therefore be suggested that while Natural Disasters should be within the capacity of pupils of a mean chronological age of 13.11, Spotlight on World Problems may be more difficult for some pupils. This is borne out by the results of the cloze tests shown in Figure 87a and 87b. While Class 3 recorded a mean score of 55% for the test on Natural Disasters, their mean score for Spotlight on World Problems was 43%. Well over 80% of the pupils were able to operate on both text books at the instructional level.

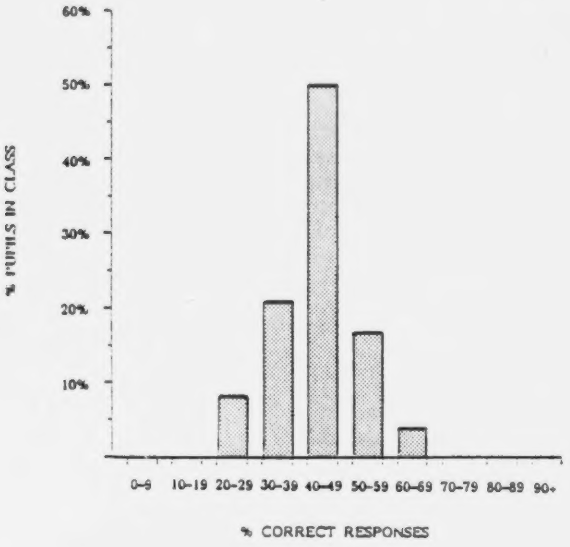


Fig. 87a. The results of a cloze test on Book 18: Spotlight on World Problems with Class 3 of Teacher Seven. Pupil N = 24; Deletion N = 50; Mean = 43%

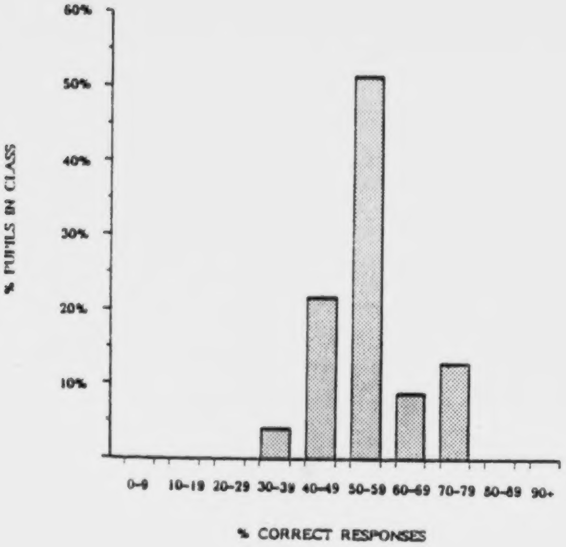


Fig. 87b. The results of a cloze test on Book 27: Natural Disasters with Class 3 of Teacher Seven. Pupil N = 23; Deletion N = 50; Mean = 55%

B. Record of lessons

a) The written diary

Figure 88 is a summary of the diary kept by Teacher Seven of his lessons with Class 3. It shows that text books were used in just over half the sessions, usually to provide individual teaching resources, particularly maps or photographs. No questions or activities from the text books were used, and the teacher-initiated activities were mainly non-experiential and required pupils either to write impersonal descriptions of phenomena already described orally or to imagine that they were involved in a specific natural disaster and to describe their experiences. The two experiential activities required pupils to find and record examples of soil erosion in their local area as a homework activity and to interpret a map and a photograph.

b) Audio recording of lessons

This teacher made an audio recording of a single lesson with Class 3. The lesson was based on a newspaper article on Amazonia which the teacher read to the class and enlarged upon. The pupils had a map of Amazonia in Spotlight on World Problems (Book 18) open in front of them. The teacher asked six questions during the twenty minutes of the recording, all of which were classified as non-experiential and requiring confirmation. Unfortunately the recording stopped just as the written work required of the pupils was being explained, but the teacher confirmed later that the pupils were asked to write an account of "Problems of the Amazon" in which they would have been asked to describe problems faced both by those who wished to exploit the mineral and agricultural potential of the area and the native tribes. The map to which the pupils were referred at the start of the lesson was not used thereafter and was not required as part of the written work.

SUMMARY OF DIARY OF TEACHER 7 :CLASS 3 :N.= 31

Volume of text book usage: No. of sessions recorded: 14 (14 school periods)
No. of sessions in which text books used: 8 : 57%

Text books used during period of diary (and no. of sessions used):
No. 18: Fawcett; World Problems (3) ; No.27: Marchington; Natural Disasters (3)
(Two other books were used to provide a map and photograph for one lesson each)

Of the 8 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 0 (0%); made reference to elements of tb: 5 (63%);
used tb as basis for exposition: 2 (25%); taught entirely from tb: 1 (12%);

No. of sessions in which elements received particular reference:
Text: 4 ; Photo: 5 ; Map: 5 ; Diagram: 0 ; Graph: 0 ; Table: 1

Pupil activities: Pupils did not study the text book alone.

Pupils copied a map from the text book during 1 session.

Pupils' completion of Questions/Activities
There were a total of 5 Q/As. Of these 60% were Non-exper'l; 40% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
6 (100%) in writing, all of which were teacher-initiated

Non-experiential questions (N = 3):
Rhetorical: 0%; Confirming: 66%; Integrating: 0%; Open Ended: 33%;Valuing: 0%

Experiential questions (N = 2)
Of these, one activity required pupils to find and record examples of soil erosion in the area between the school and their homes; the other required pupils to study a map and photograph of an historic English city and explain why that city suffered severe traffic congestion. In the classification adopted for this study, the former would involve pupils in the integration of general principles and the observation of examples of situations in which those principles were active. The latter would involve pupils in the integration of principles and inferring causation.

Fig. 88

C. Pupils' responses to their books and lessons

Figure 89a and 89b show Class 3 pupils' perceptions of the use of the six modes of data presentation in their two text books, Spotlight on World Problems (Book 18) and Natural Disasters (Book 27).

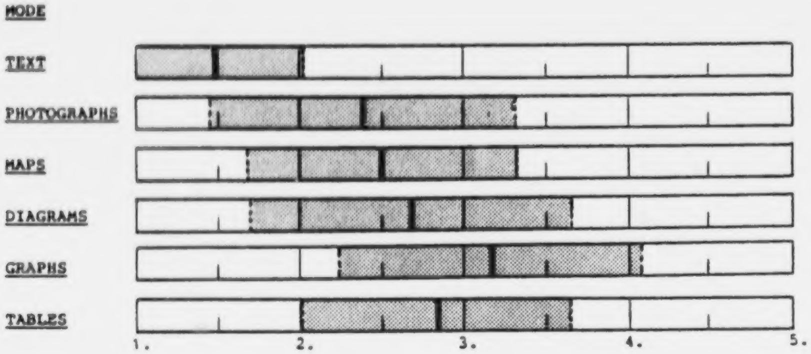


Fig. 89a. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 18 by the pupils of Teacher Seven, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

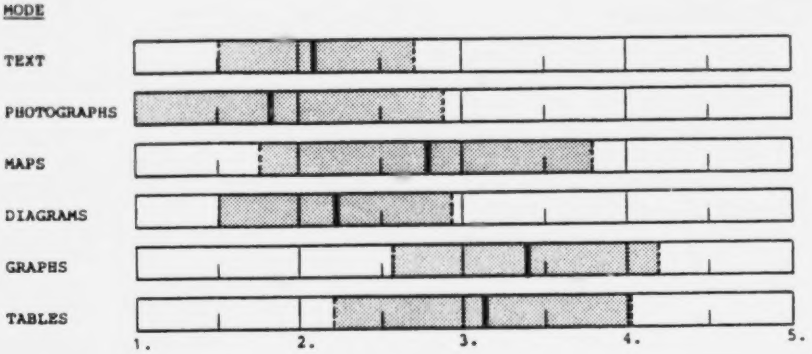


Fig. 89b. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 27 by the pupils of Teacher Seven, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean.)

Figures 89a and 89b show that pupils in Class 3 perceived the text to predominate in Spotlight on World Problems with photographs, maps and diagrams to occupy smaller but similar areas of the book, while in Natural Disasters photographs are seen as being more common than text and diagrams, with maps of markedly less significance. Graphs and tables are seen as being of least significance in both books. In their geography lessons, these pupils perceived text as being the main resource used, and while maps were seen as being used slightly less, all the other modes of data presentation are seen as being used with great frequency (Figure 90).

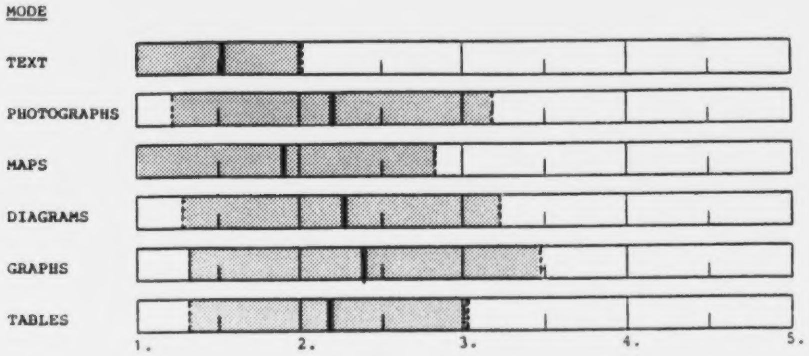


Fig. 90. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Seven, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 91, which illustrates the pupils' assessment of the six modes of presentation, shows that photographs, maps and diagrams are seen as having greatest value, while the text, graphs and tables are seen as having rather less. This response is similar to that of Class 1.

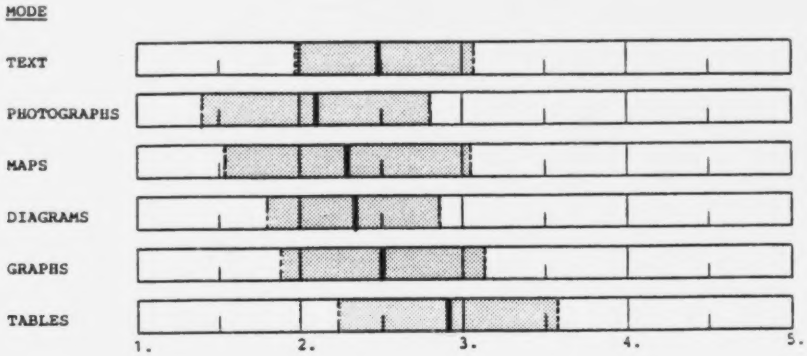


Fig. 91. Pupils' assessment of the six modes of data presentation: Teacher Seven, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 92 shows the responses of Class 3 to the teaching strategies.

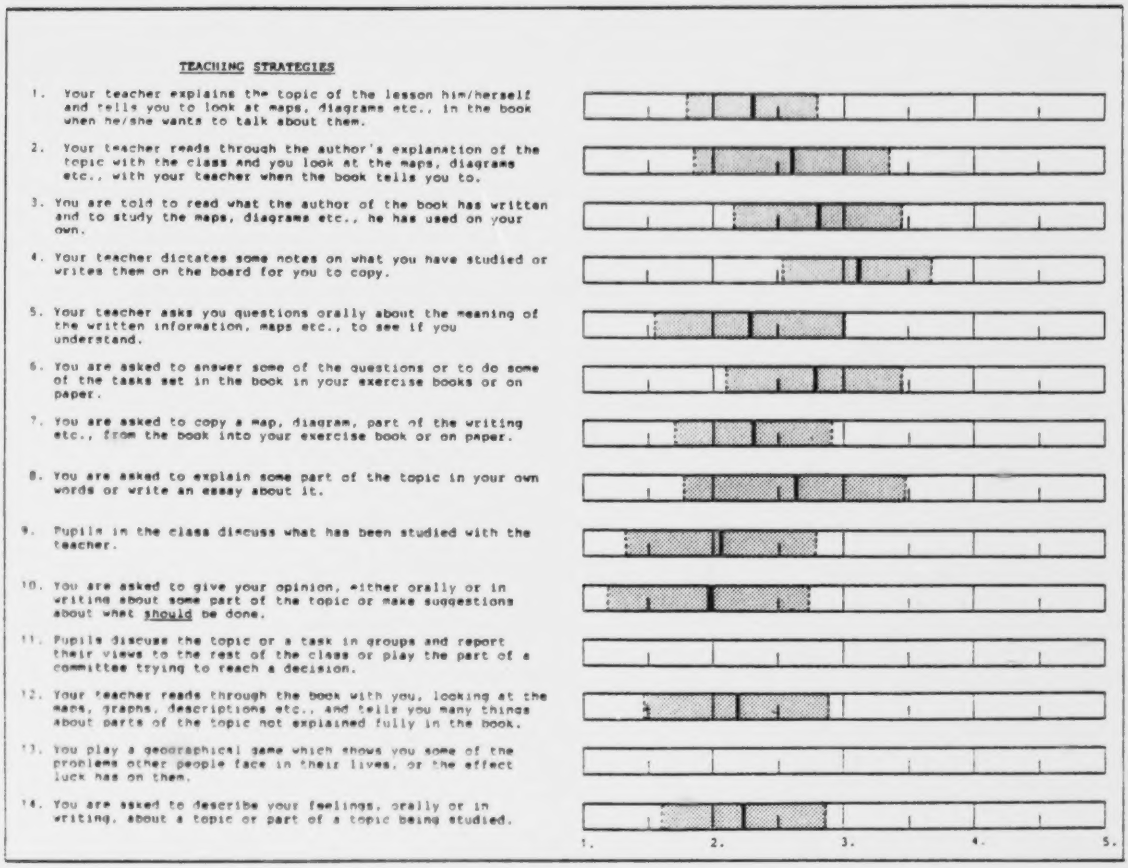


Fig. 92. Pupils' assessment of the fourteen teaching strategies Teacher Seven, Class 3.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 92 shows that Class 3 denied having experienced geographical games or group discussions. Of the other twelve teaching strategies, they accorded their most positive valuation to discussions with their teacher which include their feelings about the topics being studied (10, 9, 14), while also valuing highly the teacher's elaboration on the text books and oral questioning (12, 5). The pupils recorded their lowest assessments for strategies in which they had low degrees of direct contact with the teacher, including writing their own explanations (8), answering text book questions (6), reading the book on their own (3) and taking dictated notes (4).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER SEVEN BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Seven followed the structure of the text book closely with Class 1, although he also taught almost half the sessions using only elements from the book to illustrate his exposition. Most of the pupils' written work was selected from the text book, and gave pupils experience of working with a wide range of data presentation types. With Class 3 the teacher used a number of text books to provide illustrations for his own presentations. The pupils accomplished much less written work, and used a narrower range of presentation modes. None of the questions or activities from the text books were used with Class 3, while those teacher activities which were pursued were most commonly non-experiential. Both classes regarded illustrations as having much greater value for their learning than the text, while placing great emphasis on those teaching strategies which place them in close contact with their teacher.

4. THE DISCUSSION-INTERVIEW WITH TEACHER SEVEN

Teacher Seven stated that he regarded text books as being tools to be used by teachers as they saw fit. He had "strong objections" to a text book being a syllabus guide or a source of complete studies on various topics. This stance was progressively moderated as the discussion proceeded.

He explained that the school syllabus for Class 1 was planned around Patterns in Geography One while the syllabus for Class 3 was established before specific resources became available. When asked about the syllabus for first year geography classes, the teacher expressed great satisfaction with the text book: "the design of this book is almost as good as any teacher could get. There is no real need to look any further to find information to teach from". He emphasized that "that doesn't mean I follow the text book willy nilly. Even with higher ability classes I am selective, and with lower ability classes, selection is even more important. I often just select a diagram or a picture and design a work programme around these rather than using the text. The text is often too difficult for lower ability classes". The teacher went on to explain that while the book contained a good range of topics and skill development questions and activities, the range was too great for lower ability pupils. He, therefore, concentrated more on verbal understanding with the lower ability first year classes, and concluded that the teacher is more important for the learning of lower ability pupils than for those of higher ability.

With lower ability third year classes, this teacher stated that he used a text book more for control than for education purposes: "For learning to be possible, control is essential. They cannot learn when they are afraid that they will be punched or their pens and pencils stolen. To keep control of a low ability third year class, a tight lesson is necessary. This can involve a greater use of the text book than is really desirable. I feel that a feeling of security in the class is more important for less able pupils than a high degree of content in educational terms" With pupils of higher ability, such as Class 3, a text book was felt to be unnecessary: "I find that my own knowledge and what the class can offer, often results in a better educational situation than using a text book. The text book is almost irrelevant. .... With brighter classes, I am not under any pressure in the classroom so I can adapt my lesson to the class."

Teacher Seven felt that the resources available in the school were as good as he could reasonably expect, but he would nevertheless have liked a greater range of resources to use with his third year classes. "I am not very imaginative as a teacher, and so I need a greater range of resources to keep the pupils interested. This is much more difficult with less able pupils than with brighter classes. I collect a lot of my own resources from newspapers and magazines, but less able pupils find it difficult to appreciate what an earthquake, say, is like. Really we need more visits to places like the Geological Museum to stand on the earthquake machine. It's the ability of the teacher which really makes up for not doing things like that, not the quality of printed resources."

The teacher repeated that he would like a greater range of resources at his disposal, but that these did not have to be in print form. The text books available were quite adequate as text books, although he added that he usually used them in connection with his own worksheets as the questions and activities provided were rarely appropriate to his classes. The comparisons which were frequently made in the conversation between the upper ability class for which the teacher maintained the diary and the parallel lower ability third year class which he also taught indicated that this was an area of considerable concern for this teacher, who elsewhere described his preferred teaching style as essentially discursive. It seems that such a discursive style was not successful with less able classes. This conclusion was supported by statements on the questions and activities in text books: "I like exercises which involve the interpretation of photographs, field sketches, etc., either based on tape/slide sequences or text books. These are very successful with more able pupils, but the least able cannot think quickly enough".

While the teacher claimed to use all the possible sources of teaching resources sometimes, he emphasized that lessons were usually planned on the basis of whatever was easily available. This not only included the resources of his geography department, but others such as newspaper and magazine clippings and holiday photographs. He considered that this was possibly why his pupils' perceptions of the frequency of use of the various modes of data presentation showed a relatively small range. He explained that he usually began a new topic with a consideration of maps, photographs or diagrams orally with the class, before going on to study the written word.

In discussing the use of written text, Teacher Seven suggested that many pupils enjoy being read to rather than reading themselves, because the intonation of the reader can make meanings clearer, especially when the passage requires an emotional reaction. He agreed that pupils would only ever be asked to read text themselves after the teacher had explained, read aloud or otherwise set the scene. When written answers or activities were set, the teacher expected pupils to be able to complete the activities on the basis of the verbal explanation only, athough many pupils liked to refer to the text book as a reminder. The teacher stated that no information was ever required from the pupils which had not been explained verbally by the teacher. This approach was confirmed in the context of Class 3: "I feel the atmosphere in that group is so pleasant that everything has been discussed to such an extent that if the pupils have any questions they will have been able to ask me direct. They usually have some resource in front of them in case they forget anything. The text book is just a backup"

The teacher was asked to give his opinion of the importance of reading in geography. "Throughout life, so much information is provided in written form that reading and interpretation must be encouraged in geography. It is important for pupils to have the confidence to work from written text." Despite this statement, however, the teacher considered that most written resources given to pupils in school were either irrelevant to the lives of the pupils or so complicated that pupils found understanding very difficult. The teacher thought that he would not necessarily use the written word more with his pupils if text at a more appropriate level were to be available: "I would like better, but I don't want more". The teacher explained that, in his opinion, the teacher's explanations were the most important resource in geography. "With brighter classes I am happy with my present teaching style. I am happy and I feel that my classes gain. With less able classes, if suitable resources were available, I would use them to allow pupils to work at their own speed if they want to." It may be assumed that this was another reference to the problems of class control.

The immediate response to an enquiry about the role of photographs was for the teacher to refer to the importance of the photographic interpretation questions in public examinations. He claimed to use photographs with all ages and ability groups, although he emphasized that the contribution of any photograph was dependent on the teacher's ability to "make a photograph live". He felt that the teacher's interpretation of a photograph was essential if pupils were to learn anything from it. For this reason, the role of photographs in his teaching was nearly always as a part of an oral lesson, other than for examination question practice. The teacher summarized his approach to the photographs contained in the text books: "The art is for the teacher to encourage pupils to try to interpret the photograph orally. The teacher can then draw the points made together and suggest the things the pupils have missed, offering an explanation if necessary. The pupils may then be asked to write an interpretation of the photograph themselves."

While using atlas maps rarely, and topographical maps never, this teacher considered that maps were essential in describing distributions on the earth's surface. He used maps in text books, on overhead transparencies or in wall displays to illustrate his explanations of distributions, but also regarded the manipulation of maps to be an important skill for pupils to learn. He explained one teaching sequence: "I ask the class to find well-known volcanoes on a map of the world and mark them on an outline map. Then they copy the earthquake belt from the text book. When the class says 'why are the two patterns the same?' I can then explain plate tectonics". The teacher wished that text books would include many more exercises and activities to give pupils practice in extracting information maps. He felt that the map work exercises in Patterns in Geography One were very good, and suggested that his pupils did not record maps as being more important in their perceptions of presentation mode usage because they did not regard farm plans and land use maps as "real maps".

Regarding his use of graphs and tables, the teacher stated that "statistics are very important in geography. My university course was statistics based and I still think that statistics are important. I don't believe in using tables and graphs to reinforce the text. I would rather start with the figures and interpret them with the class. They become the basis for a discussion. The text can then be used to summarize what the table or the graph is saying." He went on to explain that "the older the pupils are, the more discussion there would be on the statistics, due to pressure of work. With younger pupils or less able pupils, they can work on the figures themselves". This would suggest that although the teacher regarded the ability to work from raw data to be important, the exigencies of public examinations with their perceived emphasis on factual recall prevented it with older pupils. Regarding Class 1, the teacher stated with approval that "Patterns One builds up the skills of handling statistics well. By the end of the first year course, the pupils have a good grasp of statistics", while for Class 3, he stated that "Natural Disasters and Spotlight on World Problems include lots of tables so the teacher can use these in any way he chooses." However, this teacher was unable to suggest any reason why his pupils apparently did not value graphs and tables very highly compared with other modes of data presentation.

When Teacher Seven was asked to rank the teaching strategies according to their importance in his teaching, he rejected a number which had received positive responses from his pupils. Further discussion suggested that this discrepancy may have been in part due to differences in interpretation of the strategies (for example, strategy 11 refers to group discussion, which both classes deny having experienced, while the teacher included it on the grounds that pupils were asked to produce written responses to questions in the style of written submissions to a committee) and in part due to the teacher's differentiation between those strategies which he regarded as teaching strategies and those which he regarded as class control strategies.

Accordingly, Spearman's correlation test revealed no overall correlation between the pupils' assessment and the teacher's ranking. However, when the test was limited to those strategies which both parties agreed were used, a Spearman's R of 0.88 with Class 1 and 0.74 with Class 3 was obtained, suggesting a positive correlation between those strategies valued by the pupils and those felt by the teacher to be most typical of his teaching.

Both classes recorded very positive responses to strategies in which the class interrelated closely with the teacher and this accorded with the teacher's own perception of his teaching style: "I am a teacher who likes talking. Many of my lessons are entirely talking - even with less able classes". The teacher was surprised at the relatively high ranking accorded by his pupils to copying from a text book (7). He explained that pupils prefer positive classroom control: "so long as the majority know that the less motivated minority are busy doing something, they can relax and let themselves learn", while : "a lot of these kids think that it is more important to write something in their exercise books which is correct than to have a go at doing something themselves". As for the pupils' low assessment of text book questions and activities (6), the teacher responded: "they want to see the teacher working. They regard the teacher's job as being to teach." This view of teaching appeared to be shared by the teacher as well as being attributed to his pupils. Later in the conversation he commented that: "It is the teacher's job to direct what goes on in the classroom".

This teacher's attitude to the questions and activities included in the books was summed up by the comment "I could do without them all". However, he conceded that, in teaching, new ideas are needed and that the suggestions of authors might provide inspiration for new approaches.

On the subject of the ideal text book, mention was made of a range of resources, photographs, diagrams, graphs and tables, all of which should be described fully in the text, together with good factual descriptions of the topics. The purpose of these was explained as being to provide a backup for the teacher: "to expect a teacher to teach day after day without any resources is unreasonable. The text book allows a teacher to do his job adequately when he is not really feeling up to talking alone. The stress levels are too high when there are no resources to fall back on.... The text book gives the teacher security." Although this comment would seem to indicate an emphasis on factual recall, the teacher also explained that he considered the teaching of the skills of map, photograph, statistical and text interpretation to be essential educational aims as well as the answer to examination success, and for this a range of teaching resources was needed. "I try to teach all these skills orally with my pupils. Data response questions are a good way for our pupils to get Ordinary Level passes."

The text book for this teacher was a source of resources on which he could base his own, mainly oral, lessons in which he taught not only factual knowledge, but also the skills of interpreting a range of presentation modes. The presence of a single text book also offered security for the teacher who could find activities to give to a restless class and also, by following the broad pattern laid down by the author, be convinced that he was following a course of study for which he was not, ultimately, responsible. Throughout the discussion, the teacher repeatedly spoke positively about his course with Class 1, based entirely on *Patterns in Geography One* while emphasizing the importance of the teacher being independent of the text book. With Class 3, on the other hand, with whom the teacher made less use of a text book, it would appear that the pupils were exposed to a far narrower range of learning experiences and resources.

VIII. TEACHER EIGHT

Teacher Eight entered teaching at the end of a three year initial training course in history as a mature aged student and graduated in geography four years later following part time study. At the time the data for this study was being collected she had been teaching for about ten years and was in charge of both history and geography teaching in the school, an eight-form entry mixed comprehensive in a London borough. It was school policy for all pupils to be placed in one of two bands according to ability soon after entry, and to be placed in sets in each subject within their band. The teacher agreed to keep a record of her lessons with the fourth set of the upper band in the first year, and the top set in the upper band of the third year. Part of the period during which the diaries were kept coincided with the school internal examination period and an in-service course during which the classes of Teacher Eight were taken by a supply teacher.

CLASS 1

A. The structure and readability of the text book

The geography syllabus of first year pupils in geography in this school was based on Patterns in Geography One (Rice, Book 44). This book, being the first of a series of three intended for the first three years of secondary education, is intended for pupils of the age of Class One. The summary of the analysis of this book (Figure 93) has received comment in relation to the account of Teacher Seven, Class 1. The readability levels of the book as indicated by the Flesch and Fry measures (Appendix I) appear to be appropriate for first year pupils. The mean class score on a cloze test was 50%, suggesting that the class is able to respond to the book at the instructional level. Figure 94 shows that a fifth of the class achieved scores of less than 40% which would suggest that they would be working at the frustration level with this book, while a fifth achieved scores of over 60% which would suggest that they could use the book independently.

SUMMARY ANALYSIS OF BOOK 44: Rice Patterns in Geography One

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	25	7	19	1	1	53
Textual references to illustrations: None:	-	38	75	67	100	100	55
In passing:	-	56	25	22	0	0	39
Detailed:	-	6	0	11	0	0	6
Percentage of illustrations used in Questions/Activities	-	94	100	100	100	100	97

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 65

	Non-experiential	Experiential
-ercentage of all Questions/Activities	19	81
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	72
Integrating	73	28
Open ended	27	0
Valuing	0	0

Fig. 93. Summary of the analysis of Book 44 used by Teacher Eight with Class 1

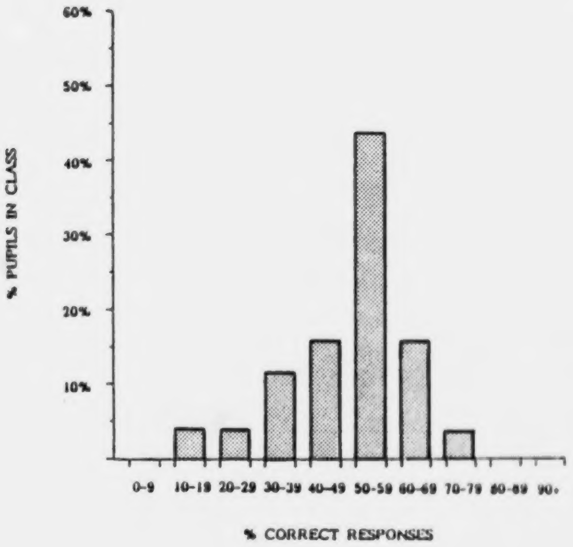


Fig. 94. The results of a cloze test on Book 44: Patterns in Geography One with Class 1 of Teacher Eight. Pupil N = 25; Deletion N = 63; Mean = 50%

B. Record of lessons

a) The written diary

The diary of lessons with Class One covered only 7 sessions, and the summary of the diary (Figure 95) shows that the text book was used in all these sessions. The teacher used the text book as the basis of her own exposition rather more frequently than she referred to diagrams, photographs or maps independently of the author's account. The pupils read the book alone only after the teacher had explained the topic, but this explanation did not usually extend to oral completion of the questions or activities before the pupils attempted these in their exercise books. All the questions and activities completed by the pupils were taken from the text book, and all were experiential, requiring confirmation or integration of prior knowledge from the pupils. The text book supplied all the teaching resource used.

SUMMARY OF DIARY OF TEACHER 8 :CLASS 1 :N.= 27

Volume of text book usage: No. of sessions recorded: 7 (11 school periods)
No. of sessions in which text books used: 7 : 100%

Text books used during period of diary (and no. of sessions used):
No. 44: Rice; Patterns in Geography One (7)

Of the 7 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 0 (0%); made reference to elements of tb: 3 (43%);
used tb as basis for exposition: 4 (57%); taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text: 0 ; Photo: 1 ; Map: 1 ; Diagram: 3 ; Graph: 0 ; Table: 0

Pupil activities: Pupils studied the text book alone during 1 session.
This was after the teacher had explained the topic

Pupils copied diagrams from the text book during 2 sessions.

Pupils' completion of Questions/Activities
There were a total of 23 Q/As. Of these 0% were Non-exper'l; 100% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
4 (17%) orally; 23 (100%) in writing (none of which were teacher-initiated)

Experiential questions (N = 23):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	26	26	0	0	52
Comparing	0	4	0	0	4
Organizing	17	0	0	0	17
Experimenting	0	0	0	0	0
Inferring	13	13	0	0	26
Applying	0	0	0	0	0
TOTAL %	57	43	0	0	100

Experiential Q/As referred to data sources as follows (% references, N=12):
Atlas: 0%; Other text: 0%; Photo: 25%; Map: 33%;
Diagram: 33%; Graph: 0%; Table: 0% Reality: 8%

Origin of data sources referred to in Experiential Q/As:
All the resources used were to be found in the text book with the exception of soil samples.

Fig. 95

b) Audio recording of lessons

From the first contact with this teacher, she was adamant that she would not permit an audio recording of her lessons. A number of reasons were given for this, including the effect of recording on her classroom manner and an unwillingness to have her classroom performance assessed on the basis of a recording of a relatively small proportion of her class contact time.

C. Pupil's responses to their book and lessons

Figure 96 shows that these pupils perceived the photographs to be the major presentation mode of this book, followed by text and diagrams. This contrasted with the measured proportions of the various modes (Figure 93) which revealed that the text occupied almost twice the area of photographs. The pupils' perceptions, shown in Figure 97, were that, in their geography lessons, text was used considerably more than the other modes of presentation, with diagrams and graphs being used more than photographs. Their evaluation of the presentation modes, shown in Figure 98, suggests that the pupils placed greatest value on the use of diagrams and graphs, while photographs and text were regarded as being of less importance.

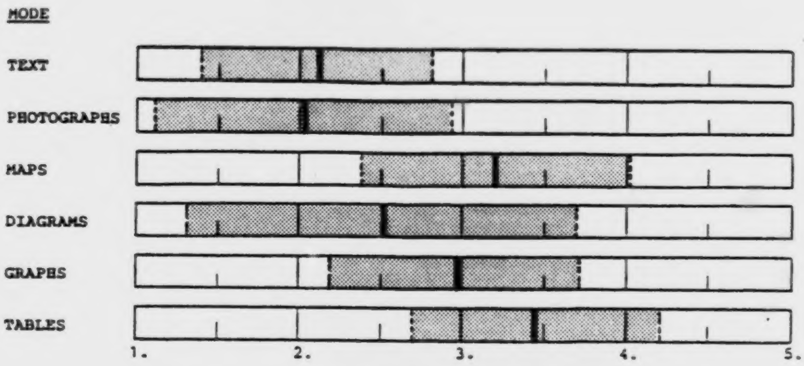


Fig. 96. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 44 by the pupils of Teacher Eight, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

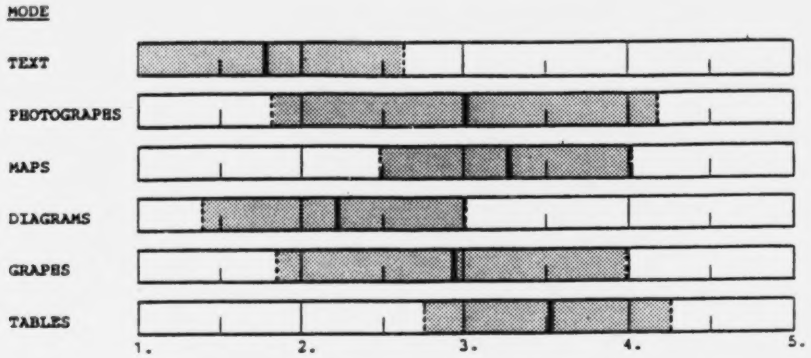


Fig. 97. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Eight, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

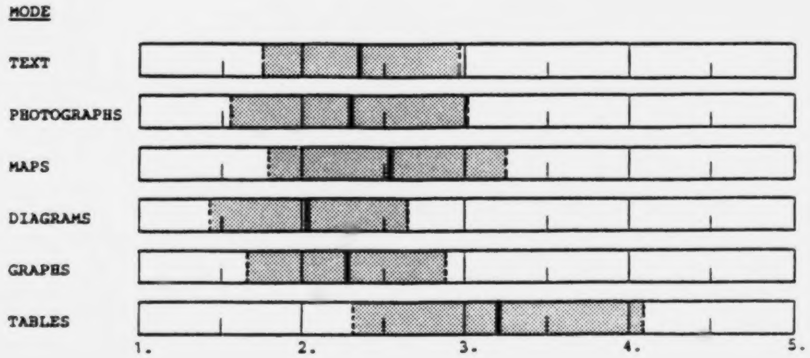
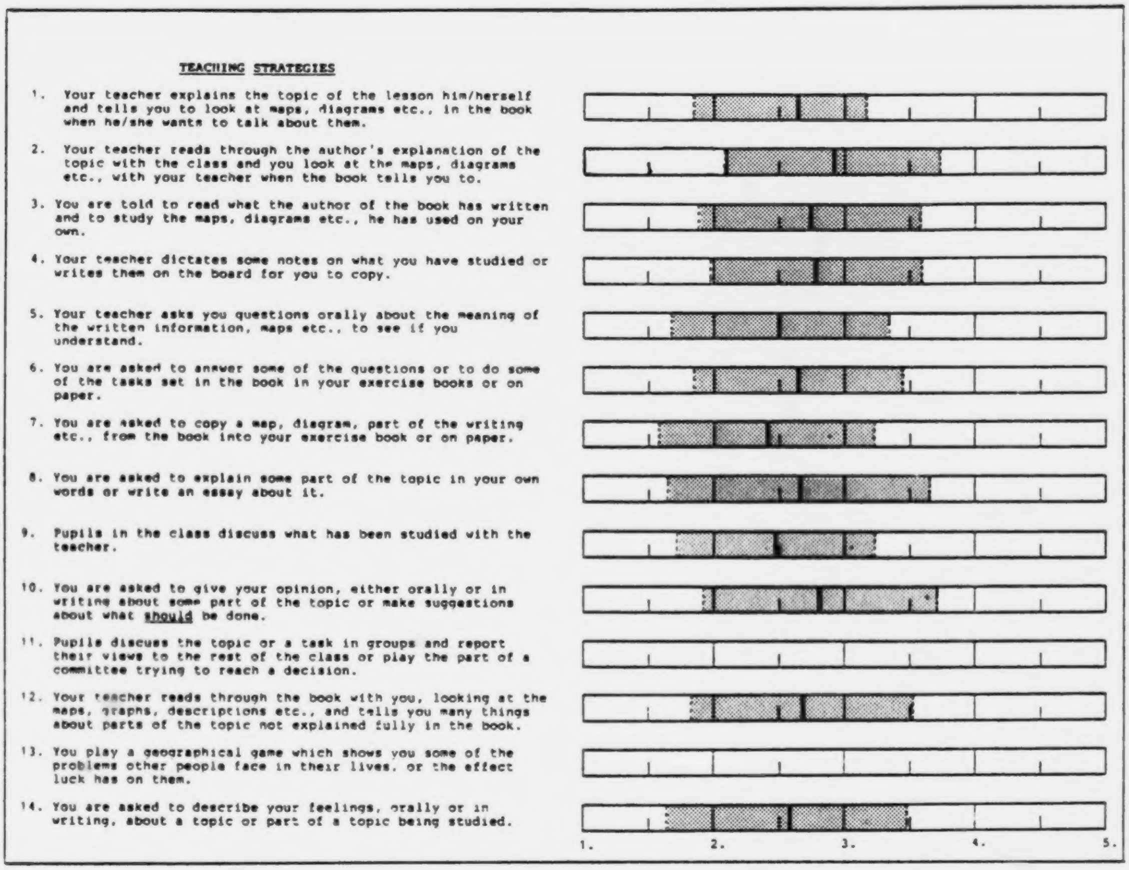


Fig. 98. Pupils' assessment of the six modes of data presentation: Teacher Eight, Class 1 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 99. Pupils' assessment of the fourteen teaching strategies
Teacher Eight, Class 1.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 99 summarizes Class 1's assessment of the fourteen teaching strategies. It suggests that Class 1 valued most highly copying, discussions with the teacher, teacher questioning, and describing their feelings (7, 9, 5 and 14), while placing least value on reading alone from the book, dictation, giving their opinions and reading from the book with the teacher (3, 4, 10 and 2). These pupils denied having experienced group discussion and geographical games (11 and 13). While this pattern of valuations based on rankings appears to be haphazard, the range of mean scores is narrow, from 2.395 to 2.889, and contrasts with the wider range of scores recorded by Class 3 which will be described below.

2. CLASS 3

A. The structure and readability of the text books used

During the period when the diary was being kept, five different text books were used, three of them being given to the class for a single session of two periods for the pupils to use alone to prepare for an essay. The two books used as part of whole class lessons were Spotlight on World Problems (Fawcett, Book 18) and Patterns in Geography Three (Rice, Book 45). The analyses of the structure of these books will be presented here. (Figures 100a and 100b) Analyses and summary analyses of the other books used by this teacher may be found in Appendices J and K.

Figures 100a and 100b show that both books devote the major part of their print areas to illustrations, with all the modes of data presentation excepting tables of figures well represented. Fawcett makes little reference to the illustrations in his text but Rice describes over a third of his illustrations in some detail. Fawcett uses two thirds of his illustrations as the bases of questions and activities, although these refer to only a small proportion of photographs and diagrams while Rice uses over 90% of his illustrations for questions and activities, with little difference between the different modes. While the majority of non-experiential questions and activities involve integration, the majority of experiential questions and activities require the pupils to confirm information presented in one mode in another. The small proportion of non-experiential questions in Rice are all open-ended, while his experiential questions are either confirming or integrating.

Patterns in Geography Three (Rice, Book 45) is the only book of the five intended for pupils of this age. However, Appendix I shows it to have the highest readability level. Despite this, the class recorded a mean score on a cloze test of 48.2% with 15% of the pupils scoring at frustration level and 7% being able to use the book independently (Figure 101a). The other four books used are all intended for use in the fourth and fifth years of secondary education, and of these, Spotlight on World Problems (Book 18) has a readability level of 14.37 on the Flesch scale and 13 on the Fry graph. The suitability of this book for pupils of third year level was confirmed by a cloze test on which the class mean score was 52%. The distribution of the scores (Figure 101b) suggests that there is considerable variation within the class, with 19% of the pupils scoring at the frustration level and 31% scoring at the independent level. Cloze tests were not administered for the other three books, but Appendix I shows that, while all three are intended for use with fourth and fifth year pupils, their readability levels are well below the chronological ages of the pupils, and it may be inferred from the results of the cloze tests mentioned above that these books would pose little difficulty for the class.

The combination of these two books appears to offer the teacher a great variety of presentation modes. Although the books do not offer very much help in their interpretation, many of the illustrations are used as the bases for the questions and activities to which about half their text is devoted. The questions and activities are mainly experiential, and all the various levels of questions and activities are represented, although valuing questions are rarely presented.

SUMMARY ANALYSIS OF BOOK 18: Fawcett Spotlight on World Problems

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	43	12	21	14	8	2	57
Textual references to illustrations: None:	-	67	71	75	100	50	74
In passing:	-	33	29	25	0	50	26
Detailed:	-	0	0	0	0	0	0
Percentage of illustrations used in Questions/Activities	-	33	86	25	100	100	68

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 40

	Non-experiential	Experiential
Percentage of all Questions/Activities	51	49
Percentage of each type of Question/Activity		
Rhetorical	37	-
Confirming	4	64
Integrating	52	27
Open ended	7	7
Valuing	0	2

Fig. 100a.

SUMMARY ANALYSIS OF BOOK 45: Rice Patterns in Geography Three

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	36	29	11	13	7	4	64
Textual references to illustrations: None:	-	40	33	57	67	100	53
In passing:	-	27	0	14	0	0	13
Detailed:	-	33	67	29	33	0	34
Percentage of illustrations used in Questions/Activities	-	87	100	86	100	100	92

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 57

	Non-experiential	Experiential
Percentage of all Questions/Activities	2	98
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	57
Integrating	0	39
Open ended	100	2
Valuing	0	2

Fig. 100b

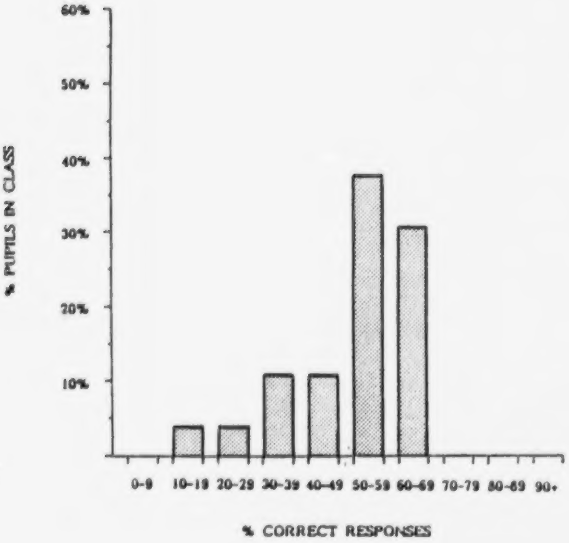


Fig. 101a. The results of a cloze test on Book 18: Spotlight on World Problems with Class 3 of Teacher Eight. Pupil N = 26; Deletion N = 63; Mean = 52%

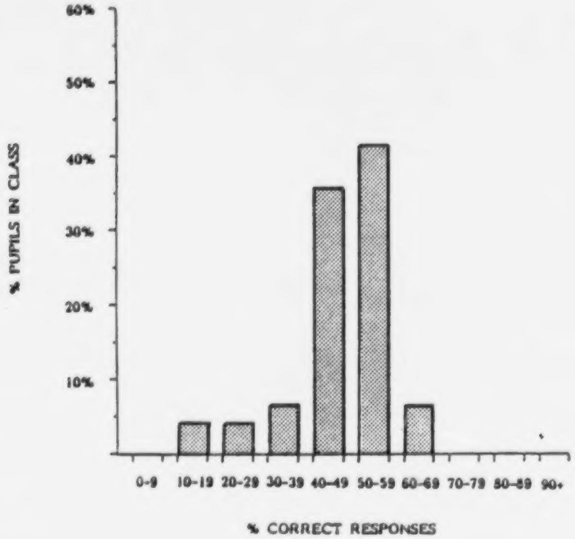


Fig. 101b. The results of a cloze test on Book 45: Patterns in Geography Three with Class 3 of Teacher Three. Pupil N = 28; Deletion N = 86; Mean = 48%

B. Record of lessons

a) The written diary

Figure 102 is a summary of the diary of lessons with Class 3. It shows that while text books were used in all the lessons, the teacher taught almost entirely from them for 3 of the 5 sessions, while pupils worked alone in the other two. During only one session were questions and exercises selected from a text book while on all the other occasions, the teacher taught the class from the text book before the class wrote open ended essays.

SUMMARY OF DIARY OF TEACHER 8 :CLASS 3 :N.= 29

Volume of text book usage: No. of sessions recorded: 5 (10 school periods)
No. of sessions in which text books used: 5 : 100%

Text books used during period of diary (and no. of sessions used):
No.18: Fawcett; Spotlight on World Problems (4) No.16: M.C.U. Earthquakes (1)
No.13: Crisp; Different Worlds (1) No.27: M.C.U. Natural Disasters (1)
No.45: Rice; Patterns in Geography Three (1)

Of the 5 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 2 (40%); made reference to elements of tb: 0 (0%);
used tb as basis for exposition: 0 (0%); taught entirely from tb: 3 (60%);

Pupil activities: Pupils studied the text book alone during 4 sessions.
Of these, 2 were after and 2 were without teacher explanation.

Pupils copied a map from the text book during 1 session.

Pupils' completion of Questions/Activities
There were a total of 11 Q/As. Of these 45% were Non-exper'l; 55% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
0 (0%) orally; 11(100%) in writing (3 (27%) of which were teacher-initiated

The origins of Q/As were as follows (no. of references):
Bk 18: 8 (73%); Other: 3 (27%)

Non-experiential questions (N = 8):
Rhetorical: 0%; Confirming: 50%; Integrating: 0%; Open Ended: 50%;Valuing: 0%
Of the non-experiential questions and activities, five were selected from Bk. 18 Spotlight on World Problems, and three were teacher-initiated activities in the form of open ended essays.

Experiential questions (N = 3):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Comparing	33	0	0	0	33
Organizing	67	0	0	0	67
TOTAL %	100	0	0	0	100

Experiential Q/As referred to data sources as follows: All three experiential questions and activities referred to two maps both of which appeared in Bk. 18: Spotlight on World Problems.

Fig. 102.

C. Pupils' responses to their books and their lessons

Figures 103a and 103b show the pupils' perceptions of their text books. While both text and photographs were thought to be the major presentation modes used in the books, text was seen as predominant in Patterns in Geography Three while photographs were seen as predominant in Spotlight on World Problems. Graphs were seen as being of much greater importance in Spotlight than in Patterns.

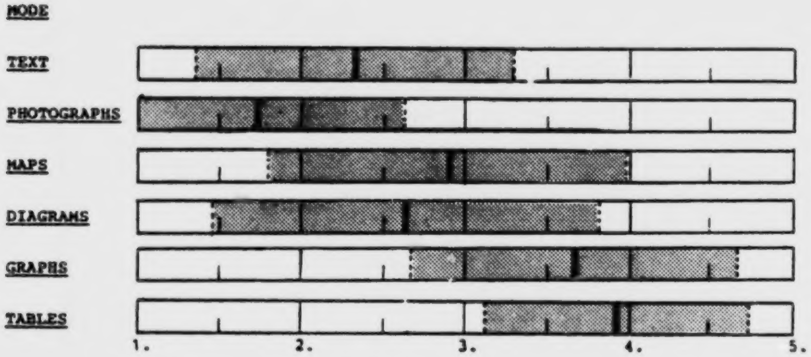


Fig. 103a. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 18 by the pupils of Teacher Eight, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

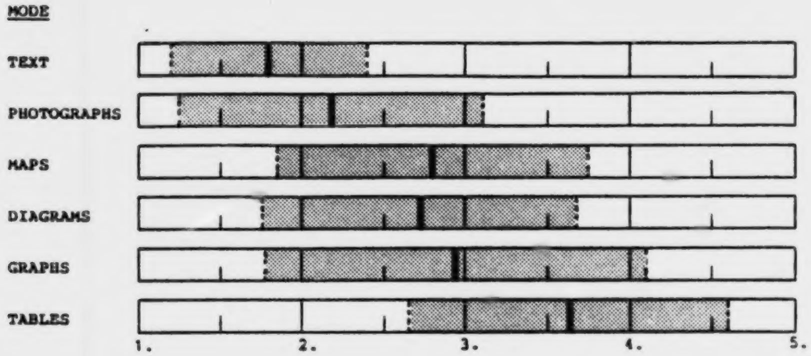


Fig. 103b. Pupils' perceptions of the level of use made of the six modes of data presentation in Book 45 by the pupils of Teacher Eight, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 104 shows that in their geography lessons, these pupils regarded text as being the most common source of data used, followed by graphs. Photographs were seen as being used least. When asked to assess the value of these various modes the pupils accorded their most favourable scores to diagrams and maps (Figure 105).

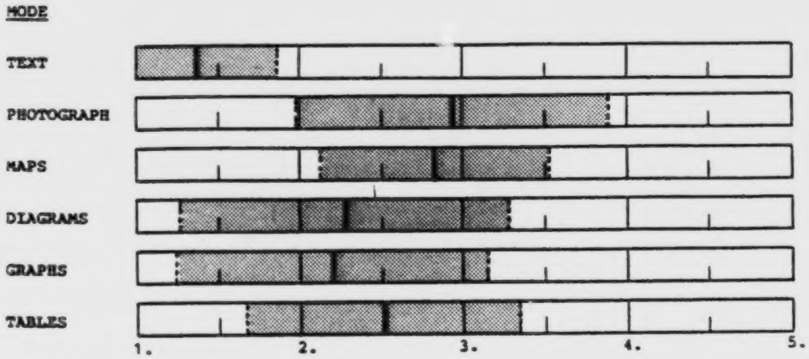


Fig. 104. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Eight, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

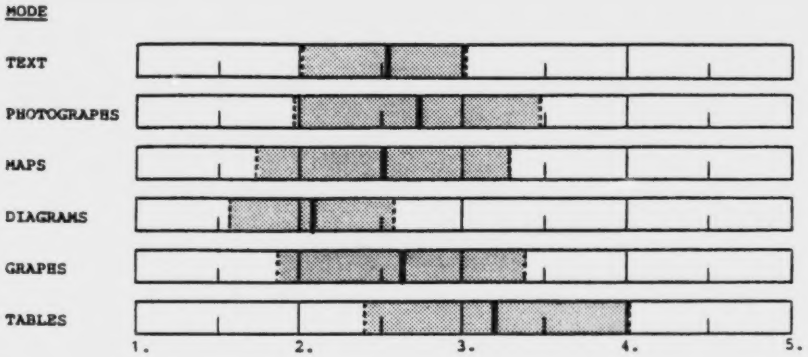
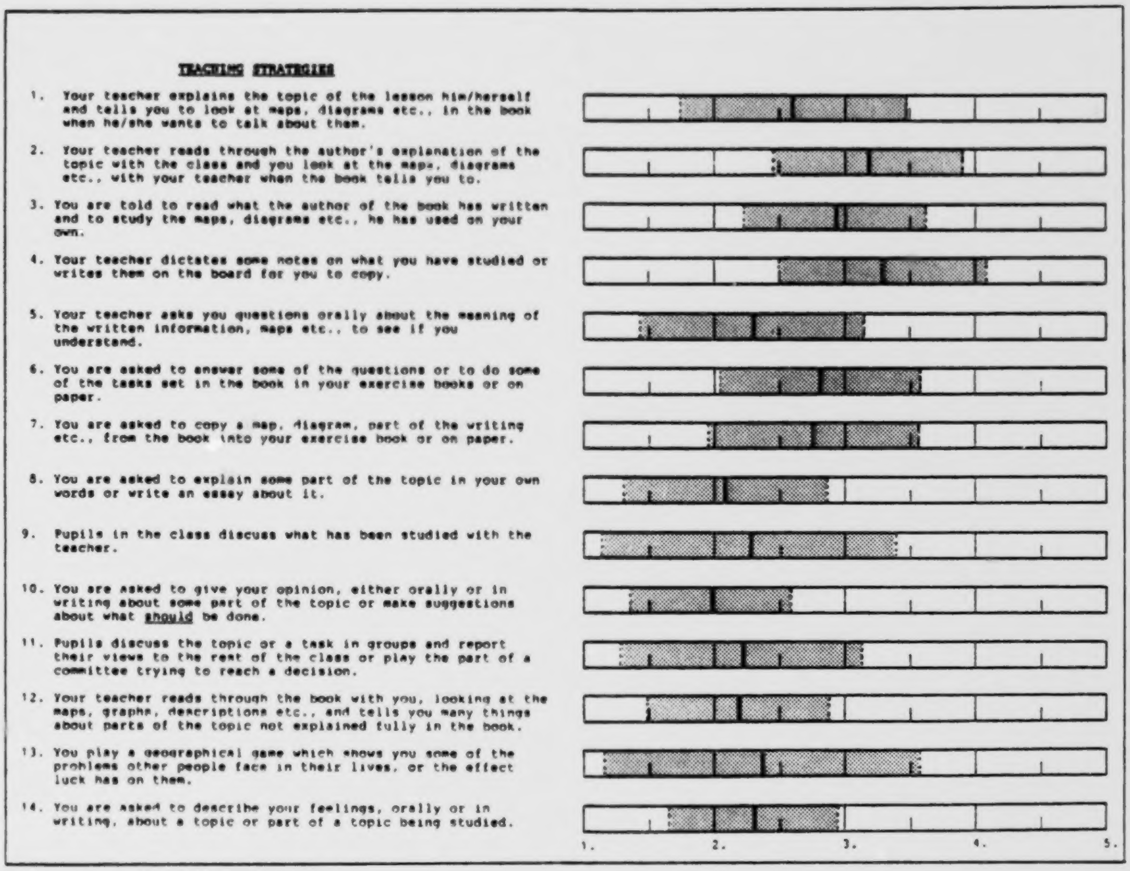


Fig. 105. Pupils' assessment of the six modes of data presentation: Teacher Eight, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

When asked to assess the various teaching strategies, these pupils agreed that they had experienced all those listed (Figure 106). They reacted most positively to strategies which gave them the opportunities to express their own opinions (10, 8 and 11) although they also appeared to value the opinions of their teacher (12). Strategies which involved the transmission of information or pupils working alone from the book, were regarded less favourably (6, 3, 2 and 4).



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 106. Pupils' assessment of the fourteen teaching strategies Teacher Eight, Class 3.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER EIGHT BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Eight used the text book with Class 1 as a source of illustrations and as a basis for her lessons but rarely taught directly from it. It appears from the pupils' responses that the diagrams and graphs in the books were used frequently in class as the basis of lessons, even though they perceived their text book to include many photographs. The teacher taught substantially the same course as that intended by the author of the text book, but often using illustrations from the book to illustrate her own exposition. The pupils were usually expected to complete the questions and activities from the book without the class answering them orally first. Like Class 1, Class 3 perceived photographs to be used little in their lessons, while the text and graphs were used much more. With Class 3, the teacher taught more lessons directly from a text book, although the small number of lessons included makes conclusions difficult.

4. THE DISCUSSION-INTERVIEW WITH TEACHER EIGHT

At the beginning of our discussion, this teacher suggested that while text books were useful as a source of individual teaching resources and might provide useful syllabus guides, their use as a source of complete studies was often prevented by their lack of rigour or poor questions and activities. She considered that the teacher should decide on the approach to each topic, and guide the pupils through a range of resources. She explained that while she had used text book questions and activities in the past, with greater experience she now preferred to develop her own approach. Nevertheless, as the head of the geography department of the school, she had planned all the syllabuses around the text books which were available: "most teaching is based on whatever is available at the time, and then updated from personal knowledge as you go along". The approach to syllabus development for this teacher seemed to be that the syllabuses were initially prepared from specific text books but when new text books which covered similar areas became available, they could be used instead of the original books. Thus, the third year syllabus in the school was originally based on Oxford Geography Project 3 insofar as the main focus of study was the "Third World". At a later date, Spotlight of World Problems was obtained and some topics were selected from that book, while recently, Understanding Developing Places was bought. During the period of the diary of lessons with Class 3, five different text books were available for use by this class. The teacher explained that she got bored by teaching the same topics every year: "Although Patterns in Geography One with the first year is an excellent course, I often feel 'Ho-Hum, It's January so it must be sheep farming'".

This teacher said that she rarely asked her pupils to read alone during class time: "Any reading they do would usually be as homework, usually as a preliminary to answering questions. I feel that if I am not talking or they are not writing in class, I'm not doing my job." She went on to explain that she felt that her pupils needed to be guided in their reading: "I find that even though the children read something themselves and think that they understand it, they often don't. They need to be told what is important". When asked if she would encourage her pupils to read more on their own if more easily read materials were available, the teacher repeated that she felt that the teacher's contribution was important: "Books go out of date so quickly, they need comment from the teacher. By making sure that the class reads at the same speed, the teacher can comment when necessary. If the pupils read long passages on their own, it is more difficult for the teacher to go back over it later. Some of the brighter children complain when I make them read at my speed, but when I let them read alone, and then ask them to tell me about it, they have not extracted what I want them to see. It's a waste of time. Perhaps I'm imposing my own will on them too much. But then, that's what I'm there for".

The teacher was asked why she used the text portion of the books at all, and replied: "Geography is a living subject. It needs a few facts and a lot of interpretation. One of my aims is to make sure that children realize that just because something is in print, doesn't make it right. What I'm really after is intelligent reading, not just comprehension exercises".

In discussing the contribution of photographs to geography teaching, Teacher Eight stated that she regarded pictures of all sorts as very important. She explained that her ideal of a still picture was obtained by using the pause button on a video cassette recorder, so that the pupils could see the picture in its context. While acknowledging the importance of text book photographs, she emphasized the need for them to be in colour and large enough to be studied in detail: "Some text book photographs are so indistinct that you don't know if they are aerial photographs of the savanna or close ups of the hide of a rhinoceros with eczema". She saw photographs as enabling pupils to understand situations which were outside their immediate experience, although she suggested that with less able pupils, the response sought was more likely to rest in the affective domain, while with more able pupils, photographs could be analysed from various standpoints. Regarding the questions and activities based on photographs and included in the text books, the teacher explained that she rarely used them: "I must be a very self opinionated teacher; I feel that everything must be explained".

When the conversation turned to the use of maps in geography lessons, the teacher said that she used maps a lot and that their use in her lessons had increased since the purchase of a new set of atlases. While she considered that the first year course based on Patterns in Geography One gave an excellent introduction to the use of large scale maps, the only other occasions during the first three years of secondary education when her pupils use a large scale map was as part of a four week block on topographical maps based on The Language of Maps (Book 54) at the end of the third year. However, the teacher explained that atlases made an important contribution to her geography lessons, and that the thematic maps found in text books were related to them. She explained that pupils were frequently asked to copy thematic maps into their exercise books: "a mental picture of where places are is important. I like to see exercise books full of maps, well coloured and neat." The teacher also claimed to use questions and activities based on maps from the text books whenever they were encountered. None of her pupils perceived maps to be of particular prominence in their geography lessons. Neither do the text books available for use with Class 3 devote a large part of their print area to maps, although Class 3 pupils placed maps second only to diagrams in importance for their learning. It may therefore be suggested that one of the effects of the new set of atlases was to increase the use of maps in the teacher's lessons in the six months between the diary being compiled, the pupils being surveyed, and the discussion taking place.

In contrast to their assessment of maps, the pupils of both classes expressed the view that diagrams were the most significant mode of data presentation in their geography lessons (Figures 98 and 105). The teacher however, was less sanguine about the advantages of diagrams for learning: "I wonder whether the children always understand a diagram as illustrating a concept. Sometimes diagrams simplify so much that children cannot understand or recognize reality". Nevertheless the teacher said that she found flow diagrams and systems diagrams useful to illustrate her own explanations and to prompt her own memory, and appreciated the provision of well drawn diagrams in text books.

Both teacher and class agreed that statistics formed a major part of geography lessons, although the pupils differentiated between graphs and tables of figures in their assessments (Figures 98 and 105). The teacher explained that graphs and charts of all kinds are used extensively in newspapers and on television and that pupils should therefore be taught how to interpret them. She attempted to introduce the interpretation of statistics whenever possible and added that while few children found difficulty in drawing graphs and charts from raw data many found great difficulty in reading graphs and drawing appropriate conclusions. She thought that this was one of the main areas in which geography could contribute to numeracy. Of other types of statistical manipulation, she felt that children of third year age were not in a position to really appreciate their meaning. "When we first got Oxford Geography Project 3 I was fascinated by using Spearman's rank, and the children used to like it too, but not any more. The children did the sums and got an answer, but they had no way of knowing whether the answer meant anything". The teacher concluded that: "whatever the teacher is enthusiastic about at any particular time becomes what is taught most in class, and what is taught most in class is what the pupils see as being most important in that subject".

Teacher Eight declined to rank the fourteen teaching strategies on the basis of their contribution to her teaching style on the grounds that she used all the strategies when she felt that they were most appropriate to the class. She explained that with a class which had recently been in conflict with the headmaster, copying or dictation might well be the most appropriate strategy for a specific session, while in other circumstances any of the fourteen strategies might be the most appropriate.

The teacher commented that the responses of her pupils to the various teaching strategies confirm that while she followed Patterns in Geography One fairly closely with Class 1, she had undermined Class 3's faith in the text books. She attributed the apparent disparity between the responses of the two classes to differences in the subject matter of the text books as well as to differences in teaching style. The narrow range of responses of Class 1 compared with those of Class 3 may reflect the teacher's preference for a teacher-dominant style compared with a text book dominated course.

The possibility that the reasons for the differences in pupil assessment lie in the attitude of the teacher was supported by Teacher

Eight's comments on the ideal text book. She said that it is easier to teach from a structured text book, but it can become very boring for the teacher. However, she conceded that while variety is probably better for the teacher, it does not necessarily mean that change is good for the pupils: "Having found a good course with good resources and activities, perhaps we should stick with it instead of constantly experimenting on our pupils".

This teacher did not consider that text books for different age groups needed to be different in style or difficulty: "It is the content that makes a book suitable for different age groups". The skills of geography, analysis of photographs, and interpretation of maps and graphs were peripheral to the main business of challenging the pupils' preconceptions: "What I'm trying to do is to make them see that there are no right answers". The teacher said that the skills should be taught as a part of this wider aim, and that providing materials on which to practise such skills was a main contribution of the text book. She added that her own technique was to encourage children to question the text book, but some of her colleagues were less able to adopt such a role and that for them, the text book was the course: "Text books can be used to prop up uneven desks and uneven teachers".

While some teachers approach the teaching of geography from the standpoint of factual knowledge, this teacher appeared to regard geography as a vehicle to teach her pupils critical and evaluative skills. In this endeavour, her main resources were the same text books as those used by her colleagues in other schools whose intentions were different. Furthermore the teaching techniques adopted to pursue these aims appeared to be mainly the traditional ones of reading through the textbooks with the class and then questioning them on the contents.

IX.TEACHER NINE

Teacher Nine had a higher degree in geography and was in the final decade of a long teaching career, most of it in the same school in Eastern England. He had had experience as an assistant examiner and co-ordinator at all levels of the public examination system. For most of his teaching career, the school had been a boys' grammar school. In recent years it had become co-educational and had admitted its first comprehensive intake two years previously. At the time the data for this study was being collected, the teacher was about to move to the new sixth form college which represented the final phase of the educational reorganization of the area.

The school policy was to place pupils in one of two bands on entry and for geography to be taught in mixed ability groups for the first three years. In years four and five, pupils were placed in sets according to their ability in geography. The teacher agreed to keep a diary for two classes, a third year upper band class and a fourth year set preparing for the Ordinary Level examinations of the General Certificate of Education.

1. CLASS 3

A. The structure and readability of the text books

With Class Three, the teacher used only one book: Farming in the British Isles (Knights, Book 25). The summary of the analysis of this book (Figure 107) shows that over half the print area is devoted to illustrations, the majority of which are photographs. Only a quarter of the illustrations are described in detail in the text, although higher proportions of maps and tables of figures are described than photographs. All the illustrations are used as the bases of questions and activities.

Half the text is devoted to questions and activities, most of which are experiential. Non-experiential questions are almost equally divided between those classified as confirming and those classified as integrating, while the majority of experiential questions are confirming.

Appendix I shows that this book has a readability level of 15.28 on the Flesch scale and 14 on the Fry graph, although individual passages were measured to be much more difficult than these figures would suggest. Overall the book would seem to be appropriate for pupils with a mean chronological age of 13.11. The teacher did not administer a cloze test.

SUMMARY ANALYSIS OF BOOK 25: Knights Farming in the British Isles

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	45	10	2	0	4	61
Textual references to illustrations: None:	-	0	0	0	-	0	0
In passing:	-	86	50	100	-	50	75
Detailed:	-	14	50	0	-	50	25
Percentage of illustrations used in Questions/Activities	-	100	100	100	-	100	100

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 50

		Non-experiential	Experiential
Percentage of all Questions/Activities		39	61
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	48	67
	Integrating	52	33
	Open ended	0	0
	Valuing	0	0

Fig. 107. Summary of the analysis of the text books used by Teacher Nine with Class 3

B. Record of lessons

a) The written diary

Figure 108 summarizes the diary of Teacher Nine with Class 3. The diary revealed that the teacher made little use of the text book, and when he did use it, it was mainly to refer to a photograph, map or diagram. The pupils were only rarely required to read the book alone following the teacher's exposition, and the only exception to this was when the teacher was absent. On this occasion, the teacher reviewed the passage with the class immediately upon his return.

The questions and activities in the book were used only during the teacher's absence and again the teacher reviewed the questions orally upon his return. As might be expected from the balance of questions in the book itself, the questions chosen were either confirming or integrating, although a majority were experiential, being based mainly on maps and photographs. The activities initiated by the teacher usually took the form of completing outline maps, drawing bar and pie charts or writing summary accounts.

During the period of the diary, the teacher based five sessions on atlas maps of the British Isles and four sessions on film strips showing the landscapes and farming practices of four different areas of Britain.

The teacher explained in a letter that he was unable to make an audio tape of his lessons due to the pressure of time and the approach of the school internal examination period.

SUMMARY OF DIARY OF TEACHER 9 :CLASS 3 :N.= 22

Volume of text book usage: No. of sessions recorded: 19 (19 school periods)
No. of sessions in which text books used: 6 : 32%

Text books used during period of diary (and no. of sessions used):
No.25: Knights; Farming in the British Isles (6)

Of the 6 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 1 (17%); made reference to elements of tb: 3 (50%);
used tb as basis for exposition: 2 (33%); taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text: 0; Photo: 1; Map: 1; Diagram: 1; Graph: 0; Table: 0;

Pupil activities: Pupils studied the text book alone during 3 sessions.
Of these, 1 was before and 2 were after teacher explanation.

Pupils copied information from the text book during 1 session when a map was copied

Pupils' completion of Questions/Activities
There were a total of 23 Q/As. Of these 39% were Non-exper'l; 61% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
All of these were initially in writing (2 (9%) were were teacher-initiated)

Non-experiential questions (N = 9):
Rhetorical: 0%; Confirming: 22%; Integrating: 78%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 14):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	21	0	0	0	21
Comparing	7	0	0	0	7
Organizing	14	0	0	0	14
Experimenting	0	0	0	0	0
Inferring	43	14	0	0	57
Applying	0	0	0	0	0
TOTAL %	86	14	0	0	100

Experiential Q/As referred to data sources as follows (% references, N=12):
Atlas: 21%; Other text: 0%; Photo: 29%; Map: 29%;
Diagram: 0%; Graph: 7%; Table: 14%

Origin of data sources referred to in Experiential Q/As:

%	Bk25	Other
Photo	29	0
Map	29	21
Diag	0	0
Graph	7	0
Table	0	14
TOTAL %	65	35

Fig. 108

C. Pupils' responses to their books and lessons

Figure 109 shows the perceptions of Class 3 of the use of the various modes of data presentation in Knights (Book 25). It shows that photographs were seen as being the most common feature of the book, with text second. The other forms of presentation were seen as having much lower frequency. Figure 110 shows that, in their geography lessons, these pupils regarded text as being used more frequently than photographs and maps. Figure 111 shows the pupils' assessment of the value of the six modes of presentation. It reveals that photographs and diagrams are valued most highly, while pupils' attitudes to text and maps, graphs and tables were less favourable.

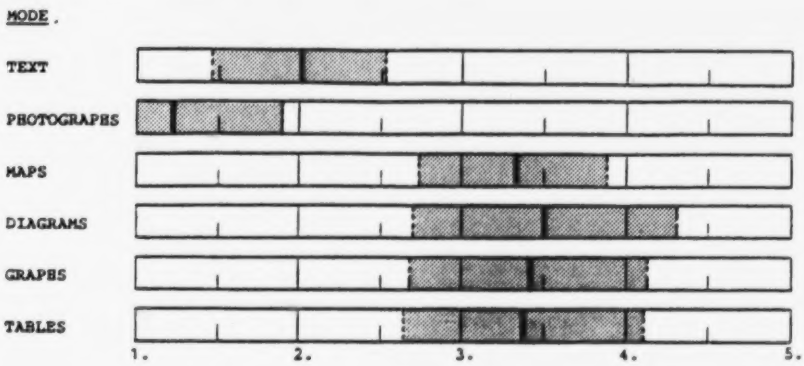


Fig. 109. Pupil s' perceptions of the level of use made of the six modes of data presentation in Book 25 by the pupils of Teacher Nine, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

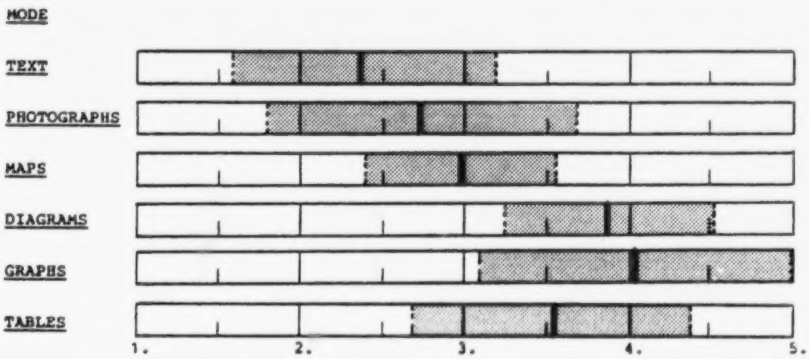


Fig. 110. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Nine, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

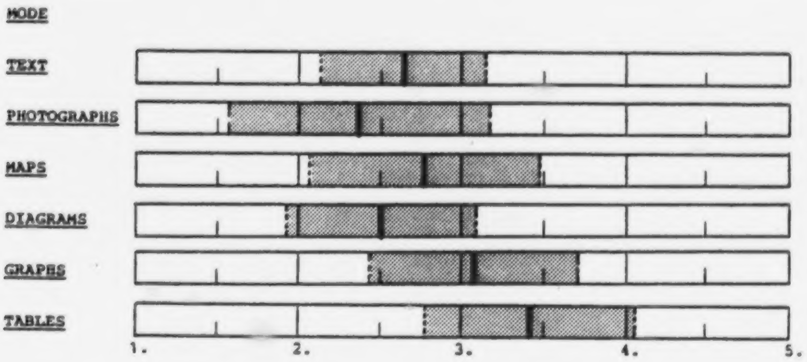
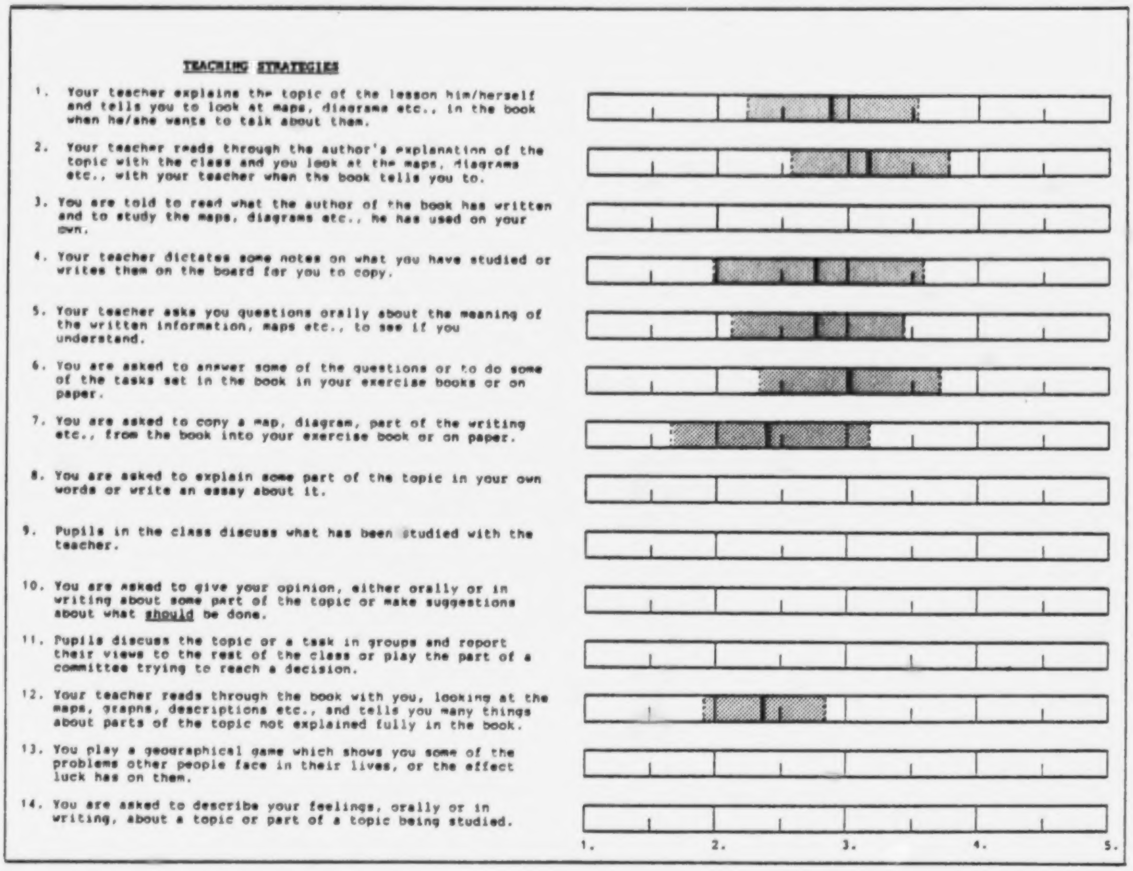


Fig. 111. Pupils' assessment of the six modes of data presentation: Teacher Nine, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 112 shows the assessment of Class 3 of the fourteen teaching strategies. These pupils denied having experienced seven of the strategies. The strategies to which the pupils responded include those which are most teacher centred and those which require pupils to copy or answer questions from the text book. Of the strategies to which they responded, the pupils valued most highly those in which the level of teacher control was greatest, (12, 4 and 5) although copying (7) was also valued. Text book questions and merely reading the text book with the teacher (6 and 2) were regarded as of least value of those strategies experienced by Class 3.



TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 112. Pupils' assessment of the fourteen teaching strategies Teacher Nine, Class 3.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 4

A. The structure and readability of the text books

With Class 4, Teacher Nine again used Knights' book (Book 25), Map Reading and Local Studies (Fullager and Virgo, Book 19) and British Isles (Morris, Book 33. The summary of Knights (Book 25) has been included in the section on Class 3 but is repeated here to aid comparisons. The summaries of the analyses of these books are shown in Figures 113 a - c.

Fullager and Virgo (Book 19) includes a predominance of illustrations, especially maps and diagrams. Half the illustrations are described in detail, especially maps and diagrams, and a high proportion form the basis for questions and activities.

Morris (Book 33) devotes most of its print area to text, and the illustrations are mainly photographs or maps. Few of the illustrations are descibed in detail, and only the table of figures in the pages sampled was used as the basis for pupil activity. Of the few questions which are included, the majority are non-experiential.

Although Appendix I shows that Knight's book is appropriate for pupils with a mean chronological age of 14.11, Morris is shown to have a mean readability level of 15 on the Fry scale and 16.8 on the Flesch scale, although individual passages vary greatly from these figures. Similarly, Fullager and Virgo is shown to require a reading age of 18.25 on the Flesch scale and 17 on the Fry graph, with some sample passages requiring a reading age of over 22. This would suggest that these books would be too difficult for fourth year pupils to read alone. In the absence of cloze test results it is not possible to comment on how these pupils would have reacted to the books.

SUMMARY ANALYSIS OF BOOK 19: Fullager and Virgo*Map Reading & Local Studies*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	7	38	11	0	4	61
Textual references to illustrations: None:	-	100	67	25	-	0	50
In passing:	-	0	0	0	-	0	0
Detailed:	-	0	33	75	-	100	50
Percentage of illustrations used in Questions/Activities	-	100	83	50	-	100	81

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 20

	Non-experiential	Experiential
Percentage of all Questions/Activities	6	94
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	25
Integrating	0	75
Open ended	100	0
Valuing	0	0

Fig. 113a

SUMMARY ANALYSIS OF BOOK 33: Morris British Isles

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	65	15	13	2	4	1	35
Textual references to illustrations: None:	-	100	92	100	100	100	97
In passing:	-	0	0	0	0	0	0
Detailed:	-	0	8	0	0	0	3
Percentage of illustrations used in Questions/Activities	-	0	0	0	0	100	5

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 7

	Non-experiential	Experiential
Percentage of all Questions/Activities	63	37
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	17	100
Integrating	75	0
Open ended	8	0
Valuing	0	0

Fig. 113b

SUMMARY ANALYSIS OF BOOK 25: Knights Farming in the British Isles

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	45	10	2	0	4	61
Textual references to illustrations: None:	-	0	0	0	-	0	0
In passing:	-	86	50	100	-	50	75
Detailed:	-	14	50	0	-	50	25
Percentage of illustrations used in Questions/Activities	-	100	100	100	-	100	100

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 50

	Non-experiential	Experiential
Percentage of all Questions/Activities	39	61
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	48	67
Integrating	52	33
Open ended	0	0
Valuing	0	0

Fig. 113c

Fig. 113. Summaries of the analyses of the text books used by Teacher Nine with Class 4

B. Record of lessons

a) The written diary

Figure 114 summarizes the diary of Teacher Nine with Class 4 and shows that the number of occasions on which a text book was used was small. Furthermore, the books were used only for reference to photographs, maps or a diagram. The questions and activities in the books were used in four sessions, all being completed individually by pupils in writing. The questions and activities which were selected from the books were almost all experiential, referred to maps in Book 19, and mainly required confirmation from pupils. Although listed by the teacher as one of the books used with this class, Morris was not used at all during the period of the diary.

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SUMMARY OF DIARY OF TEACHER  9: CLASS 4  :N.= 14

Volume of text book usage: No. of sessions recorded: 29 (29 school periods)
No. of sessions in which text books used:  6 : 21%

Text books used during period of diary (and no. of sessions used):
No.25: Knights; Farming in the British Isles  (3)
No.19  Fullager and Virgo; Map Reading and Local Studies  (3)

Of the 6 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 0 (0%);    made reference to elements of tb: 6 (0%);
used tb as basis for exposition: 0 (0%);  taught entirely from tb: 0 (0%);

No. of sessions in which elements received particular reference:
Text:  0;  Photo:  2;  Map:  3;  Diagram: 1;  Graph:  0;  Table:  0;

Pupil activities: Pupils studied the text book alone during 3 sessions.
Of these, all were after the teacher explanation.

Pupils did not copy information from the text book.

Pupils' completion of Questions/Activities
There were a total of 18 Q/As.  Of these 22% were Non-exper'l; 78% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
All of these were in writing and 3 (17%) were teacher-initiated

The origins of Q/As were as follows (no. of references):
Bk 19: 15 (83%);  Other: 3 (17%)

Non-experiential questions (N =  4):
Rhetorical:  0%; Confirming:  0%; Integrating: 75%; Open Ended: 25%;Valuing: 0%

Experiential questions (N = 14):
      %           Confirming    Integrating    Open Ended    Valuing    TOTAL
Observing             0              0             0            0          0
Communicating         7              0             0            0          7
Comparing             0              7             0            0          7
Organizing            7              0             0            0          7
Experimenting         0              0             0            0          0
Inferring            71              7             0            0         79
Applying              0              0             0            0          0
TOTAL %              86             14             0            0        100

All Experiential Q/As referred to maps in Bk 19: Fullager & Virgo
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Fig. 114

C. Pupils' responses to their books and lessons

Figures 115a and 115b show that pupils of Class 4 perceived Fullager and Virgo (Book 19) to include a high proportion of maps, photographs, text and diagrams, with fewer graphs and tables, while Morris (Book 33) was seen as including mainly text, maps and photographs. Figure 116 shows that while regarding maps as being predominant, diagrams rather than photographs were seen as of great significance in geography lessons. The other presentation modes were seen as being used less frequently. Class 4 pupils regarded maps as being of much greater value than photographs or diagrams (Figure 117)

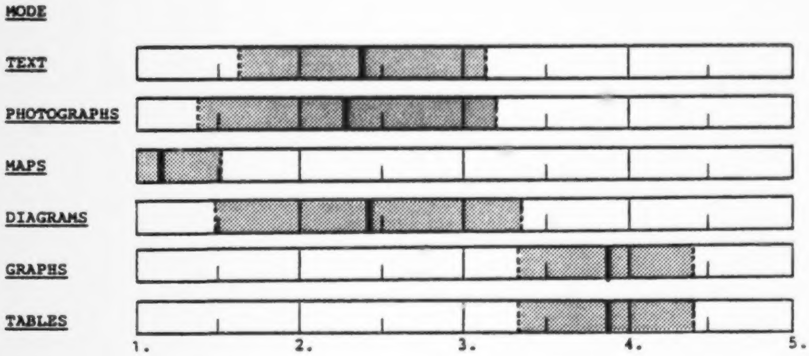


Fig. 115a. Pupil s' perceptions of the level of use made of the six modes of data presentation in Book 19 by the pupils of Teacher Nine, Class 4. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

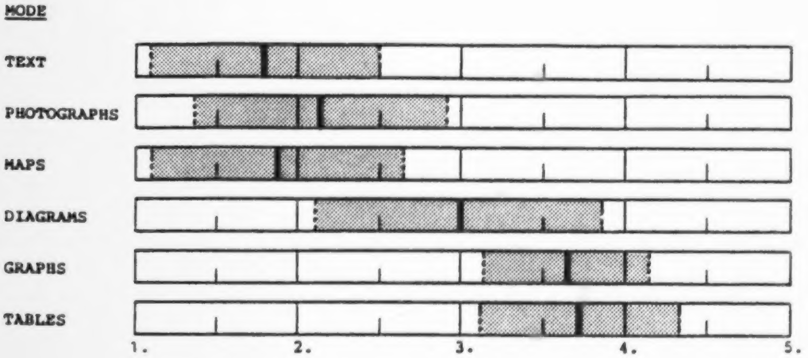


Fig. 115b. Pupil s' perceptions of the level of use made of the six modes of data presentation in Book 33 by the pupils of Teacher Nine, Class 4. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

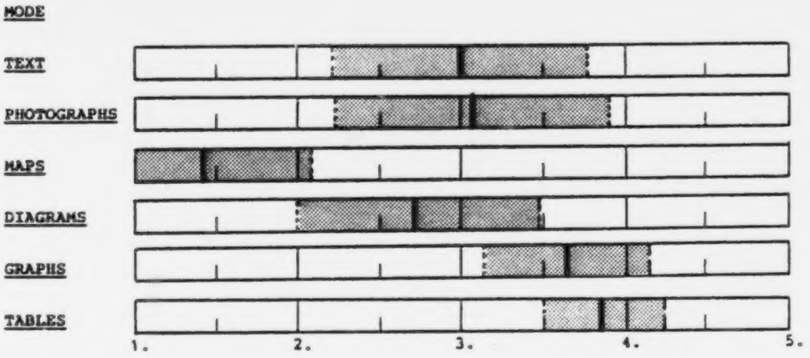


Fig. 116. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Nine, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

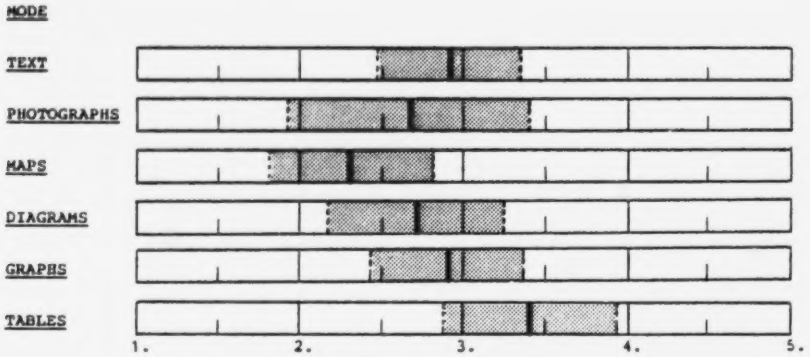


Fig. 117. Pupils' assessment of the six modes of data presentation: Teacher Nine, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

Figure 118 shows the assessment of Class 4 of the fourteen teaching strategies. This class recognized the same strategies as having contributed to their lessons as Class 3, with the addition of essay writing (8) and studying text books alone (3) but excluding reading the text book with the teacher (2). They also valued most highly teacher controlled strategies (5 12 and 1) and copying from the text book (7). Least valued were writing essays and reading the text book alone (8 and 3).

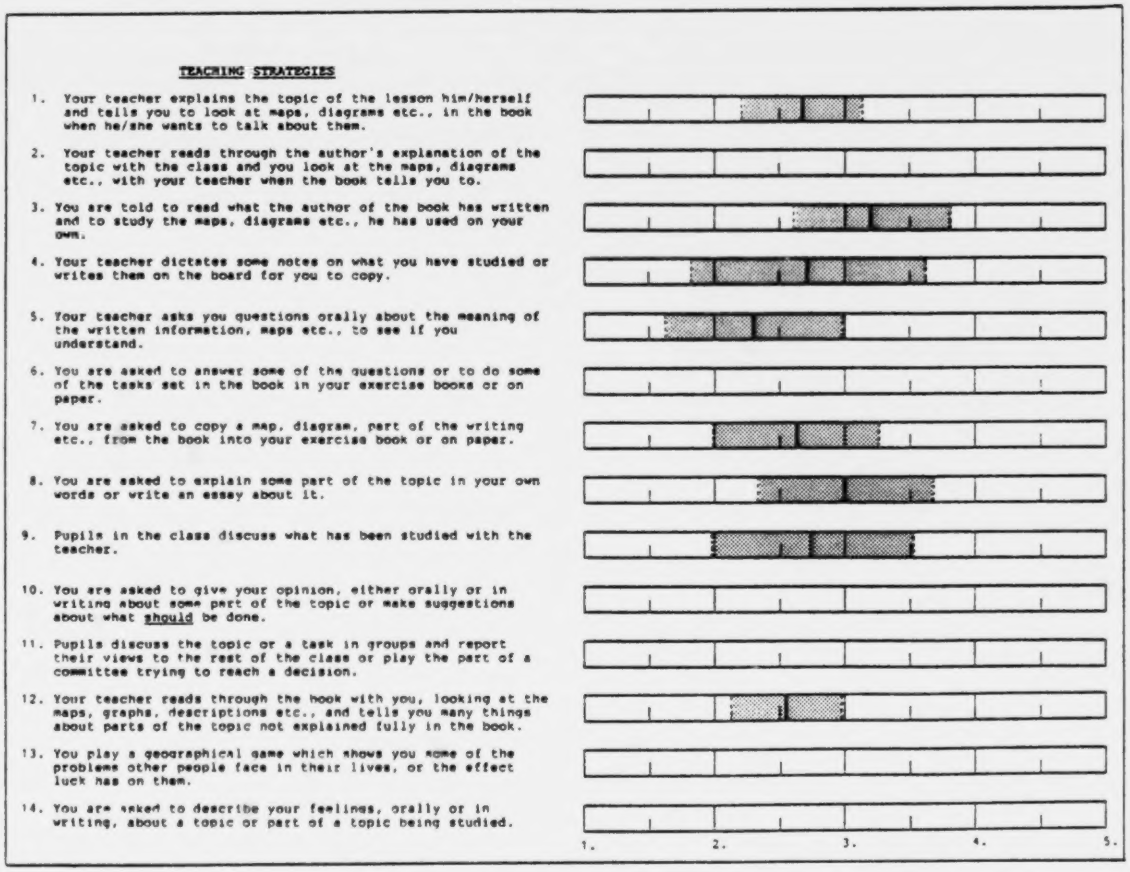


Fig. 118. Pupils' assessment of the fourteen teaching strategies
Teacher Nine, Class 4.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER NINE BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

It would appear from Teacher Nine's diaries and the responses of his pupils that he regarded landscape analysis based on maps and photographs as the essence of geographical education. Text books appeared to be used very rarely, and then only when they included an illustration, or a question or activity which the teacher wished to use. Pupils in both classes shared their teacher's perception of their lessons, and reflected his preferences amongst the modes of data presentation in their assessment of their value to learning. Despite references to examinations and summary essays on specific topics, there did not appear to be a great emphasis on factual recall.

4. THE DISCUSSION-INTERVIEW WITH TEACHER NINE

Teacher Nine explained that both Class 3 and Class 4 were following the Ordinary level syllabus of the General Certificate of Education: "We couldn't possibly do the O-level syllabus in only two years". On the contribution of text books to this syllabus, he stated: "My philosophy, if I can call it that, is simply that a text book is merely an aid to help you in any way it can. It is never a basis for a syllabus. It provides a map, an exercise; if it provides source material, then it is useful. It is merely an aid like a film strip is an aid." The teacher explained that, for him, a syllabus was something which evolved over the years, and that, therefore, no text book could cover it. "No text book gives you exactly what you want. Frequently I would take the actual factual material of the chapter and make up my own questions. I found those in the text book were either not what I particularly wanted to get out of the subject or were not very good questions. So, one might have a text and use perhaps only two or three chapters, and only a little bit of each chapter, because it happened to be just what you wanted to fit in with your particular way of thinking."

The teacher was asked whether text and photographs formed the essence of his style of teaching. He explained that there had recently been a change of syllabus, and so with Class 3 "I tended to use more text and photographs than I normally would. .... One was feeling one's way here. ... With experience one would prepare far more work on maps, graphs and tables."

In discussing the importance of the written text for pupils, the teacher emphasized the importance of pupils reading in an emergency: "In the hurly burly of school, problems arise and so reading is a quick way of settling a class to something useful. Once upon a time you could rely on lessons being uninterrupted, but as time goes on, the number of interruptions has increased." The teacher said that he very rarely asked his pupils to read at home: "for the obvious reason - they probably wouldn't do it. Upon occasions I've done it and said we will have a test on it, which of course means you must have a test, which means that a certain amount of time is .... not wasted .... but you can't afford to do that too often". That Class 3 pupils regarded text to be the most common resource they had encountered in their geography lessons (Figure 110) was explained as either being due to a number of such interruptions in the lessons preceding the survey or to the pupils failing to distinguish between the text in the book and the text provided by the teacher in the form of spirit duplicated sheets.

When asked whether he saw reading as an important skill, the teacher replied strongly in the affirmative. "Upon occasions, though not as often as one should, one uses a straightforward 'read that page' and then has a discussion to see if they comprehend, and partly to get them used to the style of writing ... particularly at sixth form level to get them used to expressing facts in an academic way." He added that: "Nowadays, I have found more and more a resistance to reading for reading's sake. With our wider intake, the ability to concentrate seems to have declined. I don't know why. In addition, I often feel that the books are difficult to read. Some are incomprehensible in terms of style for average and below average pupils."

The teacher explained that the specific way in which photographs were used would depend on the particular subject. "If you are teaching landform morphology, you would handle it differently to if you're using a photograph to help with map reading. With landform study .... either to get them to appreciate the variety of landforms, or to appreciate how you can write a very detailed description from a photograph, most pupils need to be trained to see the detail, or again, to get them to see the origins of the landscape and to build up a picture of what's happened. If it's a human landscape, we would relate the human to the physical. We analyse the pictures together. Sometimes after I have talked about a subject, I show a series of pictures on the screen and ask questions about them to arouse interest. Sometimes they do field sketches from photographs. In the fourth and fifth years I give them four or five sheets of notes printed out with some blanks for sketches, and we can work through a film strip. I do this because I don't want them to write vast amounts of notes, you can't afford the time, and you want notes to be accurate and if they write their own, they don't come out as you want them to."

The teacher acknowledged that he asked his pupils to make annotated sketches or write descriptions from photographs for homework. Regarding Knights (Book 25) he commented that since the book was written from a systematic rather than a landscape analysis point of view, the photographs were only just adequate for his purposes. Of Fullager and Virgo (Book 19) he commented that the photographs were neither large enough nor in sufficient number, while of Rice's Patterns in Geography One (Book 44)(there was a set in the school), he commented: "it's good for youngsters to show what things look like, but not very good for analysis; but perhaps they're not meant to be." The main purpose of photographs for this teacher would appear to have been for landscape analysis, either of physical landscapes *per se* or to relate the human landscapes to the physical landscape.

The use of maps was also regarded as being important in the approach to geography adopted by this teacher. "Everyone should know how to use an atlas. With these classes we issued everyone with an atlas, but since we've gone comprehensive, that would be dangerous. Over the years, we've done more and more work with maps. Twenty years ago, most children knew how to use an atlas; over the years we've had to do more to make up for the low levels of general knowledge of the world. We've gone away from learning all the small towns of Britain. That, we felt, was a rather sterile exercise". The maps in text books were regarded as being of little use. "Text book maps are often locational. They are difficult to use usefully. Good maps which show detail are few and far between." This teacher was adamant on the importance of Ordnance Survey maps. "We integrate Ordnance Survey map interpretation into the regional geography, especially from the human geography point of view. ...It seems logical to me to teach agriculture in south west England using the O.S. map. Then we do landform studies in the fifth year."

Similarly, this teacher regarded diagrams to be very important. "nearly all subject matter can be demonstrated by diagrams at any level. I think many people learn visually". The teacher believed that diagrams were best used by being built up by the teacher. Text book diagrams were rarely used. On the subject of pupils producing their own diagrams from text descriptions, he commented: "I don't think I'm as venturesome as I should be. I had a horror of them filling up their notebooks with inadequate diagrams which they would then learn. If they did that at all, it would be in rough and then be copied up when corrected. But that takes time."

Teacher Nine also believed that geographers were in a good position to show how statistics should be presented and that pupils should realize how the media and others could cheat with statistics. His syllabus introduced pupils to drawing bar charts and pie diagrams in the first year, and developed from there. He considered that such charts were a visual way of making a point, but that as pupils developed, they would be more able to appreciate how the original statistics could stand on their own. Although he considered that Fullager and Virgo (Book 19) used statistics in their activity exercises "quite well", he felt that older text books gave very little statistical material which the teacher could use. "Text books on the whole don't present enough statistical material and not in the form in which they are usable." This teacher obtained most of his statistical material from higher level text books or from original sources.

When asked to rank the fourteen teaching strategies, the teacher confirmed his pupils' perception that games and the description of feelings (13 and 14) had no part in their geography course. However, he also rejected a strategy in which pupils were asked to read a book on their own (3) although it was recognized by his Class 4 pupils. When the rankings of the teacher and Class 3 were compared as a whole, the number of strategies which were not recognized by the class as having been experienced in geography lessons resulted in an insignificant correlation (R = 0.46). Comparisons of only those strategies which both class and teacher agreed were used showed a relatively high level of correlation (R = 0.87). With Class 4, the overall correlation coefficient again failed to reach significance (R = 0.67) but rose to 0.93 when those strategies which were rejected by both teacher and class were eliminated from the calculation. This would suggest that there was a fairly high level of agreement that pupils valued those strategies on which their teacher placed most emphasis.

In discussing the various strategies, the teacher confirmed that neither of the two classes being studied had experienced geographical games, ("we didn't get round to it with that group"), although the teacher did claim to use such strategies in his teaching: "We do a steel game I devised and also I've done one on finding the most suitable holiday resort by ranking climatic statistics". He acknowledged that "we should have done more. The time element was against us, but that is a fault of my teaching; we should have introduced more lower down the school". He considered that games could be very useful: "We did use one from that Oxford book (Oxford Geography Project 3, Book 22) on cattle trading in Ghana but we had to adapt it. We had a student from .... who did a game. It went on and on and on. I don't know whether at the end they knew any more than if they hadn't done it". To the suggestion that the process of decision making might be the object of such games rather than the acquisition of factual knowledge, the teacher stated that he felt that a clear distinction should be drawn between geography, which he defined as the study of location, and decision making, which he saw as being part of politics. "It is not easy to eliminate political bias, but it should be done. We should start from a decision and investigate the most suitable location. The decision itself is political."

The Class 3 perception that they were not required to write descriptions was also confirmed. "I'm loathe to do much writing before the fourth year probably because I know that some of the efforts would be like a poor set of notes. They are trained to write essays for examination purposes in the fourth and fifth years."

The difference in perception of the importance of class discussion between Class 3 and Class 4 was explained by the teacher in terms of the syllabus. "When we do the steel game or work out the best holiday resort, there is a lot of discussion, but it is difficult for children to discuss the rain gauge. When the subject is more academic there is not much which can be discussed, it is teaching more than discussion." The teacher admitted that "It is partly my own technique that I have never really drawn children out enough. I have tended to be too factual. Nevertheless, there is more discussion over the year than is suggested by these figures."

That Class 3 ranked the use of text book questions so low and Class 4 denied the strategy (6), was of no surprise to the teacher. "Some are ridiculous, either too long, too difficult or too outdated. Some are very prissy, they assume middle class standards and speech. However, there are occasions when you want an exercise in a hurry. I don't object to questions being in a book, but often they aren't very useful" The sort of questions I would like to use refer to O.S. maps, grid references, so they don't have to be read out or printed off."

Regarding the pupils' high regard for copying and dictation (4 and 7) he suggested "They regard it as safe, particularly the ones who don't want to think. You have to do it to some extent, partly because they have to have a good set of notes for exams. We've never done a vast amount of notes; I would rather give them banda'd notes for exams. These pupils are exam oriented".

When asked to summarize his view of the place of text books in geography, Teacher Nine replied "I have my own way of using the book. I use it to supplement my own teaching. I don't want to slavishly follow a text". (The strength of his feelings on this matter was shown by the split infinitive.) He continued: "I never follow the author. He has to supply what I want. I don't want vague generalizations which I don't agree with. I want a description, a photograph, a diagram and some statistics."

"In a sense, I've taught them to be suspicious of text books. Geography text books cannot cover all aspects of the subject, and I often say 'This is outdated' or 'I disagree with that'. If a text book were just a list of what ought to be known, like many science text books, it would be deadly dull. In any case I don't want to be dictated to to that extent. It would defeat the whole purpose of education which is to find out and learn techniques." When asked to elaborate on the importance of geographical skills and techniques, this teacher confirmed that, for him, they were much more important than factual knowledge. While expressing some concern about the public examination syllabuses in geography: "too many things to do. Geographers always add, never eliminate", and the quality of some of the questions asked, the teacher confirmed that, despite these constraints, he was in favour of the public examination system: "They give definite aims and standards to reach. Doing away with public examinations would be O.K. if all pupils were taught by experienced teachers. Many teachers have no idea of appropriate standards of work."

Teacher Nine had a specific and detailed concept of the paradigm of geography he wished to instil in his pupils. Since his own strengths in geography, and his emphasis at all levels of teaching, was on landscape analysis, he clearly had no need of text books other than as sources of photographs, maps, diagrams and, occasionally, statistics. He saw his own role to be to train his pupils in the art of analysing these resources, and accordingly, had little need of written description from the authors of the books he used. His concern with accuracy and recency of materials would have prevented him from using older text books, especially those which were more concerned with providing descriptions than with training pupils in analysis. More modern text books have moved away from landscape analysis as an appropriate paradigm on which to base their structure. The resource emphasis in his classes was therefore placed on maps and projected photographs. Moreover, the teacher would not have wanted a text book based on landscape analysis since he regarded landscape analysis as an art rather than as a science. He clearly regarded the role of the teacher to go far beyond the interpretation of ideas presented in any text book.

X. TEACHER TEN

Teacher Ten was a trained graduate geographer of six or seven years' experience. She had been Head of Geography in the school, a mixed comprehensive in one of the outer London boroughs, for about two years. School policy was to divide pupils randomly into two bands, and then into ability sets within the band for each subject during years one to three. In the fourth year, geography was optional and three sets were created across both bands. The teacher agreed to keep diaries for a third year top set and a fourth year second set, the latter group being prepared for the geography examinations of the Certificate of Secondary Education. The discussion took place in the term following the period covered by the diaries, when the teacher had left the teaching profession.

1. CLASS 3

A. The structure and readability of the text book

The analysis of Patterns in Geography Three, used by Teacher Ten with Class Three, is summarized in Figure 119. About two thirds of this book is devoted to illustrations, predominantly photographs, diagrams and maps, although all the five graphics modes are represented. A third of the illustrations are described in detail, especially the maps. A high proportion are used as the basis of the questions and activities which occupy over half the text. Almost all questions and activities are experiential and although most are confirming, a high proportion require integration of previously acquired knowledge.

The mean readability scores for this book (Appendix I) suggest that it is written at an appropriate level for third year pupils, although there is considerable variability between the samples. A cloze test revealed a class mean of 44%, indicating that the class is able to use the book at the instructional level. The distribution of scores (Figure 120) shows that a third of the class scored at the frustration level while few pupils are able to read the book independently.

SUMMARY ANALYSIS OF BOOK 45: Rice Patterns in Geography Three

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	36	29	11	13	7	4	64
Textual references to illustrations: None:	-	40	33	57	67	100	53
In passing:	-	27	0	14	0	0	13
Detailed:	-	33	67	29	33	0	34
Percentage of illustrations used in Questions/Activities	-	87	100	86	100	100	92

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 57

	Non-experiential	Experiential
Percentage of all Questions/Activities	2	98
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	57
Integrating	0	39
Open ended	100	2
Valuing	0	2

Fig. 119. Summary of the analysis of the Book 45 used by Teacher Ten with Class 3

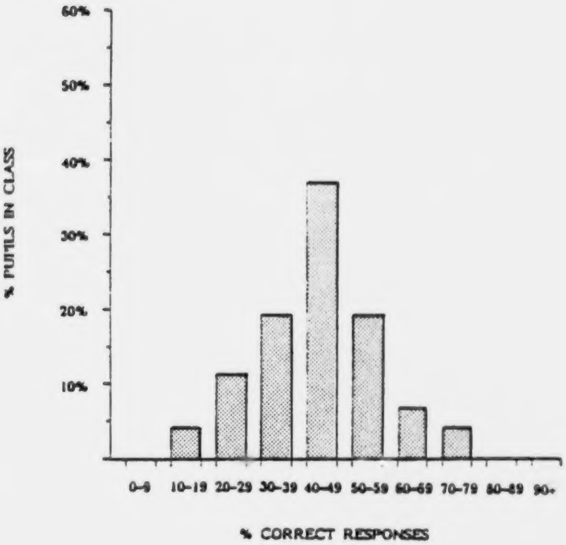


Fig. 120. The results of a cloze test on Book 45: with Class 3 of Teacher Ten. Pupil N = 27; Deletion N = 86; Mean = 44%

B. Record of Lessons

a) The written diary

Figure 121 summarizes the diary of Teacher Ten with Class 3.

SUMMARY OF DIARY OF TEACHER 10 :CLASS 3 :N.= 25

Volume of text book usage: No. of sessions recorded: 20 (30 school periods)
No. of sessions in which text books used: 14 : 70%

Text books used during period of diary (and no. of sessions used):
No. 45: Rice: Patterns in Geography 3 (14)

Of the 14 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 3 (21%); made reference to elements of tb: 6 (43%);
used tb as basis for exposition: 2 (14%); taught entirely from tb: 3 (21%);

No. of sessions in which elements received particular reference:
Text: 3 ; Photo: 3 ; Map: 3 ; Diagram: 3 ; Graph: 0 ; Table: 2 ;

Pupil activities: Pupils studied the text book alone during 10 sessions.
Of these, 2 were before; 5 were after; 3 were without teacher explanation.

Pupils copied information from the text book during 4 sessions as follows:
Text: 0 Photo: 0 Map: 1 Diagram: 3 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There were a total of 66 Q/As. Of these 5% were Non-exper'l; 95% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
33 (50%) orally; 44 (67%) in writing (none of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
All Q/As were taken from Book 45

Non-experiential questions (N = 3):
Rhetorical: 0%; Confirming: 0%; Integrating:100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 63):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	6	19	0	0	25
Comparing	3	11	0	0	14
Organizing	16	0	0	0	16
Experimenting	0	0	0	0	0
Inferring	19	21	3	2	45
Applying	0	0	0	0	0
TOTAL %	44	51	3	2	100

Experiential Q/As referred to data sources as follows (% references, N=44):
Atlas: 2%; Other text: 0%; Photo: 29%; Map: 41%;
Diagram: 9%; Graph: 5%; Table: 14%

Origin of data sources referred to in Experiential Q/As:
All resources required for experiential Q/As were taken from Book 45

Fig. 121

Teacher Ten used the text book during a high proportion of her lessons, mainly as a reference source to illustrate her own exposition. Pupils were expected to read the book alone during many of the sessions. In three of these sessions, this was without teacher assistance. Pupils were rarely asked to copy from the book. The teacher required pupils to complete a substantial number of questions and activities, most of which were experiential and all of which were selected from the text book. Most of the questions were answered orally in class before the pupils wrote answers in their exercise books. Most of the questions and activities required the integration of prior knowledge, although a high proportion of experiential questions required confirmation. Maps were the main data source used in these questions, with photographs being second most important. Diagrams, graphs and tables of figures were also used.

C. Pupils' responses to their books and lessons

Figure 122 shows that these pupils perceived Patterns in Geography 3 as consisting primarily of text and photographs, with the other modes of presentation making smaller, but similar contributions to the total book. Their perception of their geography lessons (Figure 123), also showed the importance of the text and photographs, although they also perceived the diagrams to be more commonly used than maps, and this perception was reflected in the assessments of the class of the various modes (Figure 124). Class 3 expressed their most positive reactions to photographs, text and diagrams, although the other modes, while being held in lower regard, were still assessed positively.

In assessing the fourteen teaching strategies (Figure 125), these pupils reacted most favourably to teacher-centred strategies (12, 1, 5 and 9), although they also placed playing geographical games (13) high in their rankings. Those least valued included strategies in which pupils were required to use the text book with least teacher intervention (3, 7 and 4), including a strategy in which the teacher reads the text book with the class without commenting upon it (2).

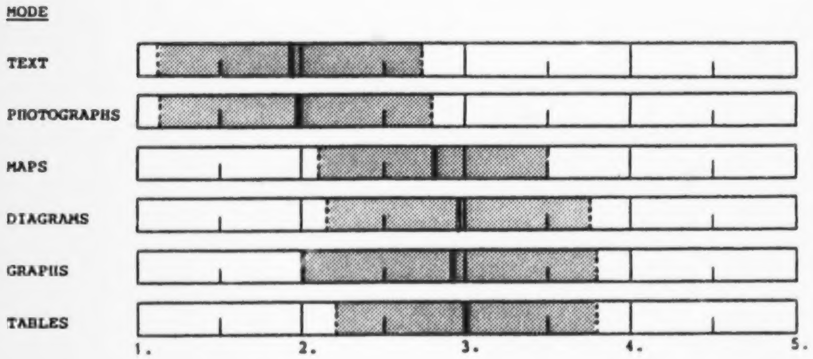


Fig. 122. Pupil s' perceptions of the level of use made of the six modes of data presentation in Book 45 by the pupils of Teacher Ten, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

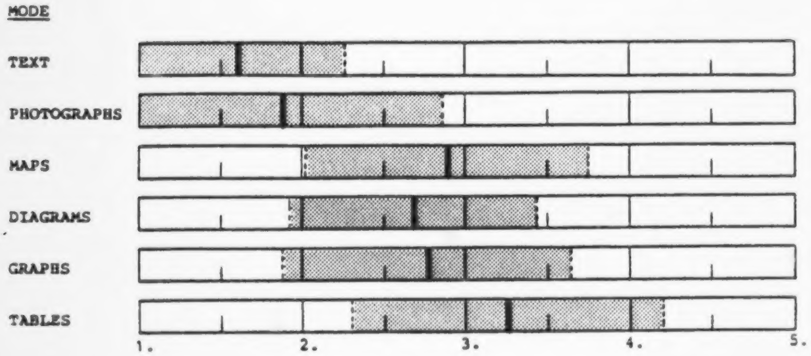


Fig. 123. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Ten, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

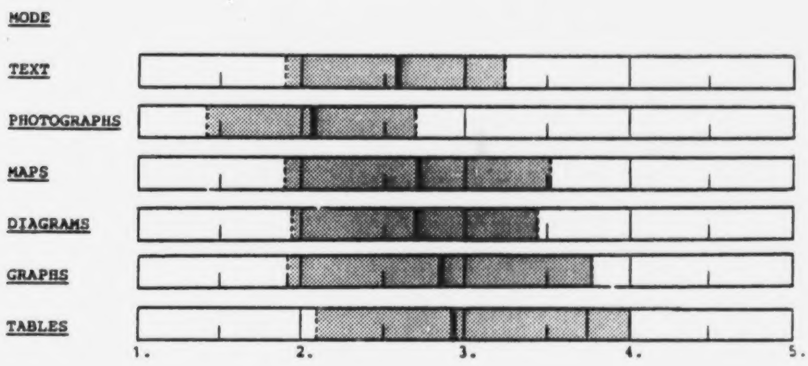
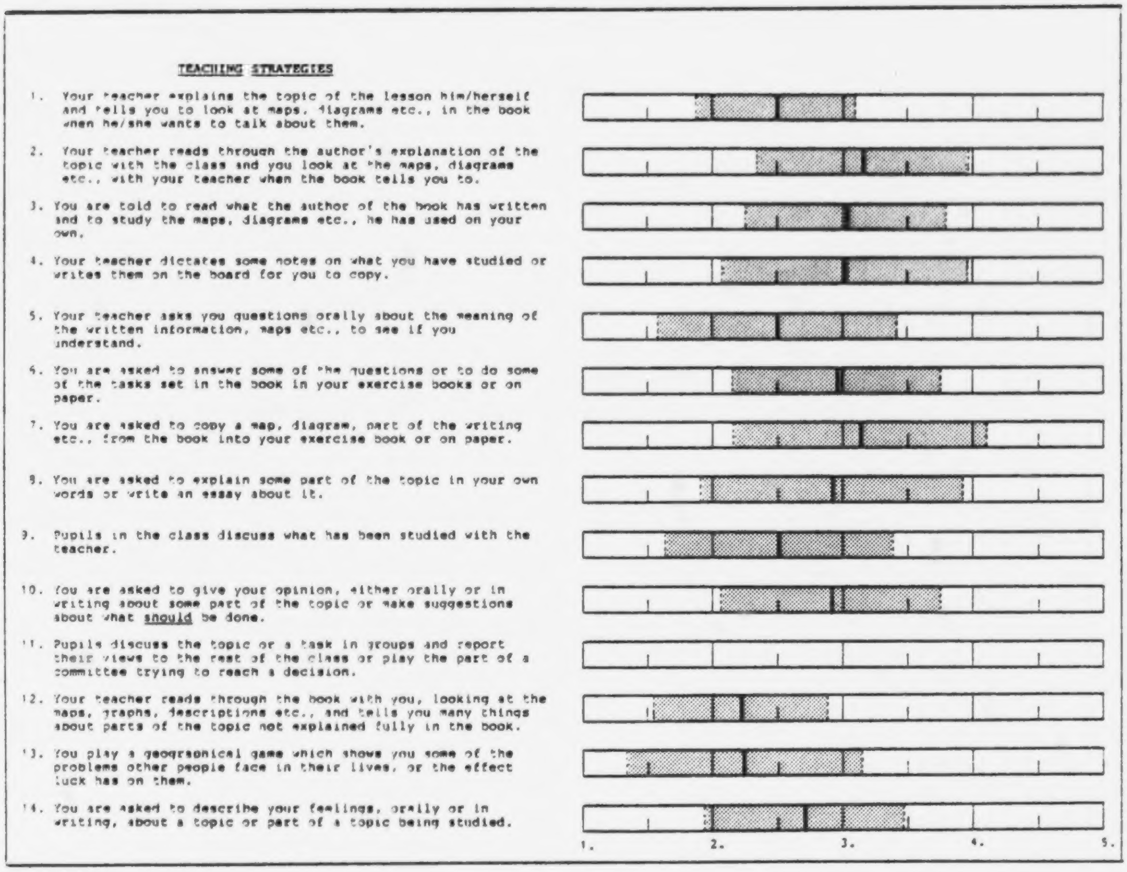


Fig. 124. Pupils' assessment of the six modes of data presentation: Teacher Ten, Class 3 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).


TEACHING STRATEGIES

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.
8. You are asked to explain some part of the topic in your own words or write an essay about it.
9. Pupils in the class discuss what has been studied with the teacher.
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.

Fig. 125. Pupils' assessment of the fourteen teaching strategies Teacher Ten, Class 3. (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

2. CLASS 4

A. The structure and readability of the text books

Figures 126a, 126b and 126c summarize the analyses of the three books used by Teacher Ten with Class 4. These were Geographical Studies in Western Europe (Randle, Book 42), Oxford Geography Project 3 (Rolfe et al. Book 46) and Europe and the Soviet Union (Young and Lowry, Book 57). Young and Lowry devotes most of its print area to text, with most of the remainder being photographs. Randle includes text and illustrations in almost equal proportions, with most of the illustrations being maps. Oxford Geography Project 3 devotes three quarters of its print area to illustrations, mainly photographs and maps. Randle and Young and Lowry describe few of their illustrations in detail while Oxford Geography Project 3 gives detailed descriptions of over three quarters of the illustrations. All the books use large proportions of their illustrations as the bases for questions and exercises. Oxford Geography Project 3 and Young and Lowry include a majority of experiential questions and activities. In both books, non-experiential questions are usually integrating, while experiential questions are usually confirming. In Randle, experiential questions are just in the minority, but unusually amongst all the text books analysed, there are more integrating than confirming questions.

Appendix I shows that both Randle and Oxford Geography Project 3 have readability levels which suggest that they should be appropriate for pupils of fourth year level (14.11), although the samples from Randle included some with readability levels two years above the age of the pupils. The readability levels of Young and Lowry ranged over the six samples from 16 to 22 years, while the average readability level was found to be 18 years of the Fry graph and over 19 on the Flesch measure.

SUMMARY ANALYSIS OF BOOK 42: Randle Geographical Studies in Western Europe

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	8	39	3	0	2	53
Textual references to illustrations: None:	-	40	88	100	-	100	80
In passing:	-	60	13	0	-	0	20
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	20	88	100	-	100	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 32

	Non-experiential	Experiential
Percentage of all Questions/Activities	52	48
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	36	41
Integrating	54	48
Open ended	10	11
Valuing	0	0

Fig. 126a

SUMMARY ANALYSIS OF BOOK 46: Rolfe et al. Oxford Geography Project 2

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	25	35	33	1	5	1	75
Textual references to illustrations: None:	-	5	33	0	0	0	12
In passing:	-	18	0	0	0	0	12
Detailed:	-	77	67	100	100	100	76
Percentage of illustrations used in Questions/Activities	-	86	89	100	100	100	88

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 38

	Non-experiential	Experiential
Percentage of all Questions/Activities	22	78
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	52
Integrating	88	45
Open ended	13	3
Valuing	0	0

Fig. 126b

SUMMARY ANALYSIS OF BOOK 57: Young and Lowry Europe and the Soviet Union

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		61	20	14	2	0	3	39
Textual references to illustrations:	None:	-	64	47	75	-	100	64
	In passing:	-	9	27	0	-	0	14
	Detailed:	-	27	27	25	-	0	22
Percentage of illustrations used in Questions/Activities		-	64	73	25	-	83	67

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 17

		Non-experiential	Experiential
Percentage of all Questions/Activities		30	70
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	36	65
	Integrating	64	35
	Open ended	0	0
	Valuing	0	0

Fig. 126 c

Fig. 126. Summaries of the analyses of the text books used by Teacher Ten with Class 4

B. Record of lessons

a) The written diary

Figure 127 is a summary of the diary of Teacher Ten with Class 4. A text book was used in just over half the lessons recorded in the diary, with Young and Lowry being used most often. In half the lessons in which a text book was used, the teacher taught closely from it. On other occasions, pupils used the book after the teacher had given her exposition. This teacher required her pupils to read the book either before or without assistance on a number of occasions. Questions and activities from the text books were used frequently and most were experiential. The teacher usually responded to the activities orally with the pupils before they were required to write answers in their exercise books. Young and Lowry was the source of half the questions, with Oxford Geography Project 3 the source of most of the remainder. Most questions and activities were confirming and based on all the modes of graphic presentation with the exception of graphs, although over half referred to maps, either in the text books or in atlases.

SUMMARY OF DIARY OF TEACHER 10 **:CLASS 4 :N.=** 19

Volume of text book usage: No. of sessions recorded: 20 (40 school periods)
No. of sessions in which text books used: 12 : 60%

Text books used during period of diary (and no. of sessions used):
No.57: Young & Lowery; Europe (9) No.46: Rolfe; Oxford Geography Project 2(3)
No.42: Randle; Geographical Studies in Western Europe (1)
Of the 12 sessions in which a text book was used, the teacher exposition:
made no reference to tb: 3 (25%); made reference to elements of tb: 1 (8%);
used tb as basis for exposition: 2 (17%); taught entirely from tb: 6 (50%);

No. of sessions in which elements received particular reference:
Text: 1 ; Photo: 1 ; Map: 1 ; Diagram: ; Graph: ; Table: ;

Pupil activities: Pupils studied the text book alone during 8 sessions.
Of these, 2 were before; 3 were after; 3 were without teacher explanation.

Pupils copied information from the text book during 5 sessions as follows:
Text: 0 Photo: 0 Map: 3 Diagram: 2 Graph: 0 Table: 0

Pupils' completion of Questions/Activities
There were a total of 56 Q/As. Of these 14% were Non-exper'l; 86% were exper'l

The presentation of Q/As as follows: (Teacher initiated oral Q/As not inc)
33(59%) orally; 52(93%) in writing (7 (12%) of which were teacher-initiated)

The origins of Q/As were as follows (no. of references):
Bk 42: 3 (5%); Bk 46:18 (32%); Bk57 : 28 (50%); Other: 7 (12%)

Non-experiential questions (N = 8):
Rhetorical: 13%; Confirming: 63%; Integrating: 25%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 48):

%	Confirming	Integrating	Open Ended	Valuing	TOTAL
Observing	0	0	0	0	0
Communicating	13	4	0	0	17
Comparing	15	4	0	0	19
Organizing	25	0	0	4	29
Experimenting	0	0	0	0	0
Inferring	19	15	0	2	36
Applying	0	0	0	0	0
TOTAL %	71	23	0	6	100

Experiential Q/As referred to data sources as follows (% references, N=48):
Atlas: 16%; Other text: 0%; Photo: 10%; Map: 43%;
Diagram: 10%; Graph: 0%; Table: 21%

Origin of data sources referred to in Experiential Q/As:

%	Bk42	Bk46	Bk57	Other
Photo	0	10	0	0
Map	0	16	21	21
Diag	0	10	0	0
Graph	0	0	0	0
Table	0	0	16	5
TOTAL %	0	36	37	26

Fig. 127

C. Pupils' responses to their books and lessons

Figures 128a and 128b show that these pupils regarded both Europe and the Soviet Union (Young and Lowry, Book 57) and Oxford Geography Project 2 (Rolfe et al., Book 46) to include substantial proportions of text, photographs and maps, but while text was seen as predominant in Young and Lowry, the photographs were seen as being of greater significance in Oxford Geography Project 2. The perceptions of Class 4 of their lessons (Figure 129)reveals that while text was seen as being by far the most commonly used resource, maps and diagrams were seen as being used more than photographs.

The pupils' assessments of the various modes of presentation (Figure 130) showed text to be the most valued resource, with diagrams and maps slightly less valued, but with photographs and tables of figures as of least value.

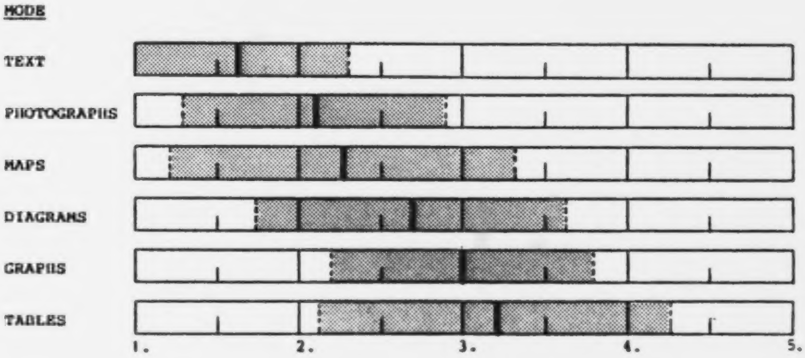


Fig. 128a

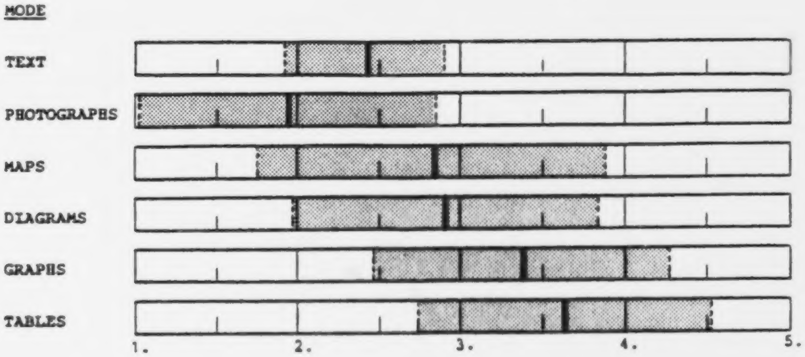


Fig. 128b

Fig. 128. Pupil s' perceptions of the level of use made of the six modes of data presentation in text books by the pupils of Teacher Ten, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

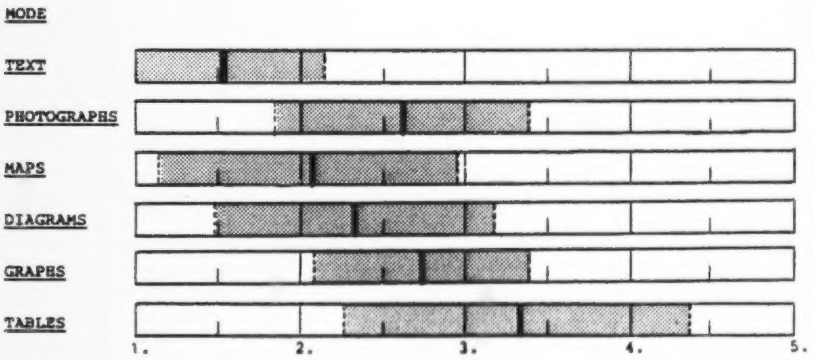


Fig. 129. Pupils' perceptions of the level of use made of the six modes of data presentation in their geography lessons: Teacher Ten, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

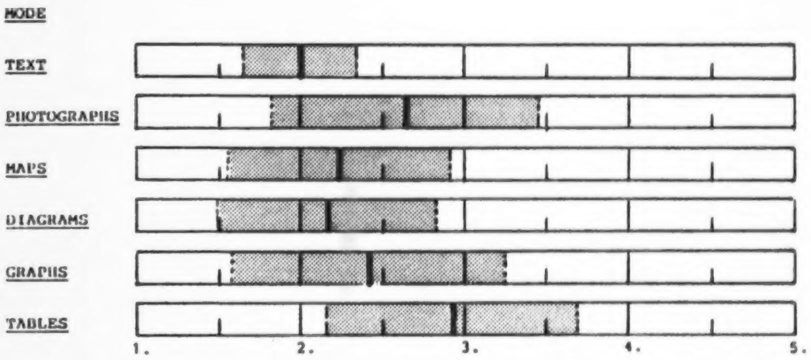


Fig. 130. Pupils' assessment of the six modes of data presentation: Teacher Ten, Class 4 (The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

In assessing the teaching strategies (Figure 131), Class 4 reacted most positively to their teacher reading and enlarging upon the book with them (12), followed by class discussion, teacher questioning and exposition (9, 5 and 4). Dictation, answering text book questions and reading the text book alone (4, 6 and 3) generated least favourable attitudes. Class 4 rejected strategies 10, 11 13 and 14, which include group discussions, games and affective activities as not having been part of their geography lessons.

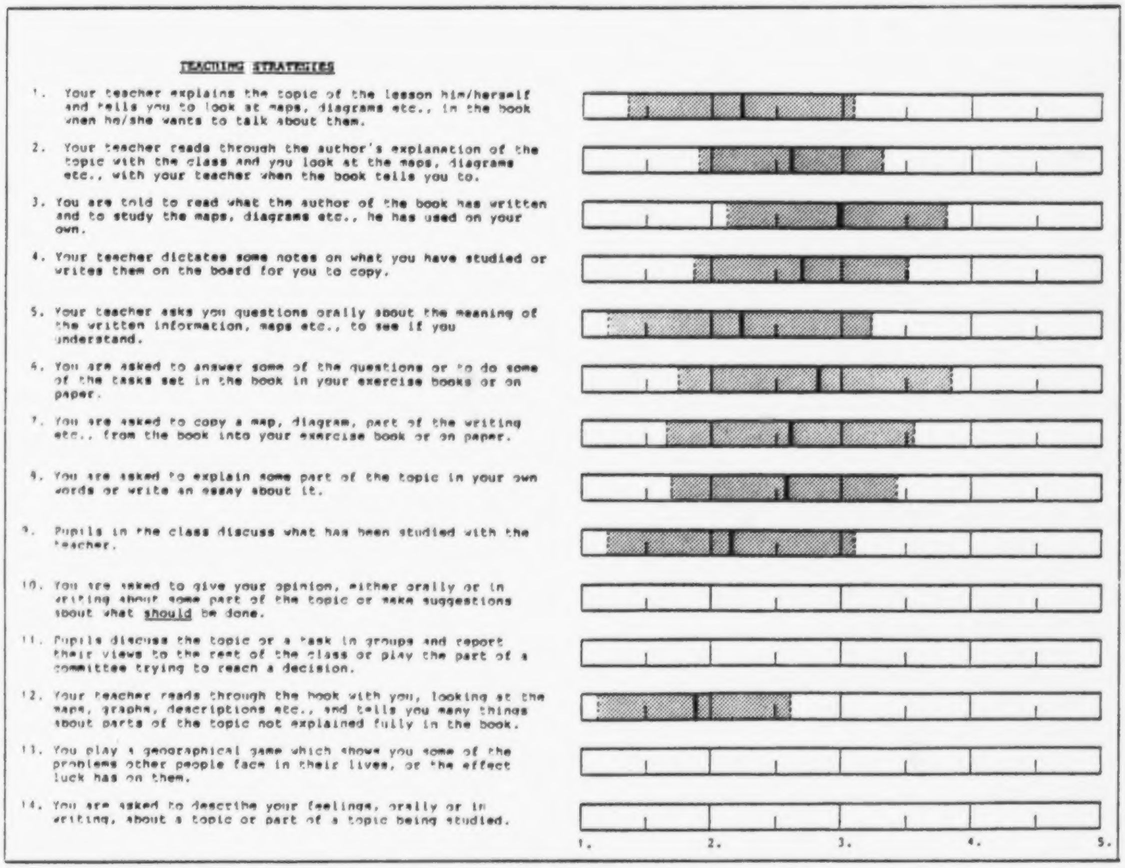


Fig. 131. Pupils' assessment of the fourteen teaching strategies Teacher Ten, Class 4.
(The vertical bold line represents the arithmetic mean; the shaded portion represents one standard deviation on either side of the mean).

3. SUMMARY OF THE TEACHING STYLE OF TEACHER TEN BASED ON THE EVIDENCE OF THE DIARIES AND PUPIL RESPONSES

Teacher Ten appeared to prefer to teach by her own personal expositions, using selected resources from the text books as illustrations. Photographs were perceived to make a much greater contribution to lessons by Class 3 than Class 4. This matched their perceptions of their text books. All pupils valued photographs as making a useful contribution to learning. On other occasions she taught closely from a book. The teacher used a substantial number of questions and activities, most of which were selected from the text books and were based on map evidence. Her pupils expressed their most favourable reactions to those teaching strategies which were strongly teacher controlled.

4. THE DISCUSSION-INTERVIEW WITH TEACHER TEN

Teacher Ten explained that when she joined the school there had been no syllabuses for geography in years one to three. She was therefore faced with the task of creating syllabuses based mainly on the existing resources, although money was made available for a class set of Patterns in Geography Three (Book 45). Thus, the teacher was able to state that "every single topic on the syllabus had a text book resource available" although she added that "some topics only had a springboard while others were well resourced".

For herself, the teacher considered that text books were important as sources of individual resources for her own expositions as well as sources of exercises and activities. She also regarded the ability to work from a text book to be a useful skill per se: "There is a need to help them to learn the self discipline of studying on their own. It is a time saver, it reinforces and reminds them of work done in class and lets them take it further if they wish."

When asked about the considerable amount of private reading suggested by her diaries with both classes, all of which followed the coverage of the topic in class, the teacher explained that although she would prefer to let the pupils read the passage themselves and then hold a discussion in class, she found that some pupils were able to read very quickly while others found it difficult and became disruptive. "The way of overcoming that problem was a short discussion or explanation first, then reading afterwards, so that they all had some ideas about the matter in hand. It was a disciplinary measure as well as an educational process." The teacher said that she would like to encourage more reading in geography lessons, especially if books with lower readability levels were available: "I am much more ready to begin a lesson by asking pupils to read and then to discuss what has been read when I have simpler books. A lot of text books are more difficult than children can cope with. It's not the concepts which they find difficult. It's the convoluted sentences". For this reason, the teacher said that after reading she would usually require her pupils to answer a series of comprehension questions related strictly to the text they had read.

Of photographs, the teacher stated: "I do not think that a geography lesson can be considered complete or successful if you have not, in some way or other, conjured up a pictorial impression of the concept you are trying to put across. I believe that concepts are better understood in pictures than in words. People tend to think in pictures, not in blocks of text."

Teacher Ten felt that she made considerable use of photographs as set in public examinations, and explained: "My favourite approach is to provide a banda'd sketch of the picture and talk about the best way to describe it so that the children can label their sketch." She also suggested that, when a particular generalization had been developed in class, pupils could be required to annotate a sketch of a specific instance illustrating that generalization. While such techniques were applied to the photographs in the text books, such photographs were frequently found to be too small to show detail. The teacher also said that she frequently used the suggestions for using the photographs made by the authors, even though she would ignore the text: "Once I'm sparked with an idea from a resource, I can teach, but if not, I get them to read the text and answer the questions". A final use of photographs on which the teacher placed emphasis was for the comparison of landscape photographs and maps, and for this she made use of Wilson's "The language of maps" (Book 54).

In further discussing her use of maps, the teacher stated that she regarded the use of maps as important, although she tended to treat their use as a skill on its own. Nevertheless, when teaching regional topics of the British Isles, she suggested that analysis of landscapes was usually approached through the use of large scale topographical maps. The teacher stated that atlases were made available to pupils during every geography lesson in the third year to provide climate maps and to enable comparisons between settlement location and relief to be made: "familiarity with atlases is very important". However, the use of maps was confined to atlas and Ordnance Survey maps. The teacher explained that she rarely used what she referred to as "extraction maps" in text books, such as maps of transport networks: "due to my own inability to handle maps like that". She was also critical of many text book maps which she regarded as too complex, and, especially when produced in monochrome, as causing problems for pupils in distinguishing figure from ground.

The role of diagrams appeared to depend much more on their provision in text books than maps did. "I was traditionally trained in geography at university and nothing in my teacher training changed that, so I am not good at creating flow diagrams. If I find good ones in text books, like the ones in Crisp's books, I use them a lot. On the other hand, sketch diagrams of physical features I can draw on the blackboard". While admitting that the diagrams in none of the text books mentioned in her diaries had made a strong impression, the teacher was surprised at the emphasis placed on diagrams in the responses of her pupils. In view of her stated interest in landscape analysis, the teacher agreed that blackboard diagrams of physical features probably loomed large in her geography teaching.

Despite the perceptions of her classes and their assessments, Teacher Ten explained that she had used statistics in her teaching progressively more during her time in the classroom. She was unable to explain the reactions of her classes, but regarded the use of statistics to be very important: "Talking about a set of statistics is a way of pulling a class together with a common problem to talk about and resolve". She regarded the choice of appropriate ways of portraying statistics as being an important skill for pupils to learn and would usually discuss this choice with the class, require the pupils to portray the figures and then discuss the conclusions which might be drawn from the portrayal. For this reason, she preferred tables of figures to completed graphs in text books, but did not feel that the provision of such resources in the books at her disposal was particularly adequate. She summarized her attitude to the use of statistics by explaining: "I was trained in the 70s when statistics were king and I remained constantly suspicious of the attempts to make everything numerical. That's not what geography is all about. Geography is, I think, to try to explain what can be at times very esoteric nuances of reasoning behind location."

Teacher Ten ranked the fourteen teaching strategies which had also been presented to her pupils, and rejected games and the description of feelings (13 and 14) as not forming part of her usual teaching style. She placed strategies which emphasized the central position of the teacher, such as those involving teacher questioning, teacher exposition, and class discussion (5, 1 and 9) high in her ranking while also claiming that group discussion (11) was important to her. With those strategies which either the teacher or the class denied as forming part of their geography lessons removed from the calculations, the correlations between teacher's ranking and class rankings were high (R = 0.84 with Class 3 and 0.8 with Class 4). This suggests that both classes valued those strategies which the teacher herself perceived as playing the greatest part in her teaching style. When told that both her classes denied having experienced group discussion, she explained that it was a strategy which she liked to use, but may not have used it in the period leading up to the pupils' completion of the questionnaire due to pressure of time: "it wasn't cost effective in terms of learning and time". However, when informed of the assessment of games by Class 3, which she had rejected, she remembered that the class had played the "Rice Farmer's Game" from Oxford Geography Project 3 (Book 22). Those strategies which the teacher regarded as least common in her style of teaching included those in which the teacher had little personal input or inter-relationship with her pupils (8, 2, 6 and 4).

The teacher explained that she did not use such strategies very much because: "one of the drawbacks of my teaching technique is that in many ways it does not allow for the gradual withdrawal of my structured approach and the takeover of their ability to cope with the topic. Many children lose confidence in striking out on their own in exploring a theme or an idea. I was too worried about letting them make a mess of things. Should it really be like this?" Similarly, in discussing strategies in which the pupils' values and feelings were explored, the teacher returned to a previous part of the discussion about the place of emotive literature in geography: "I didn't feel I could cope with emotive feedback if we read emotive passages. I had to keep a barrier between myself and the children. With any kind of evocative teaching, the barrier has to go. It was always one of my problems as a teacher. I was always too objective. One of the reasons I got out was that I felt that I was losing touch with basic humanity. My discipline in the classroom was renowned throughout the school, but I didn't dare to relax." Later she reviewed her pupils' responses and commented on the close correlation between the teacher's perceptions, the class's perceptions and the class's assessments of the teaching strategies and use of modes of presentation. She regarded this close correlation as clear evidence of the importance of the teacher. However, she also summed up what she saw as her personal dilemma in using text books with her pupils: "I cannot leave them (the pupils) alone, and they feel they need teacher".

On the subject of the questions and activities suggested by text book authors, the teacher commented that she would use them whenever possible, and only revised or altered them when they had been shown not to elicit the response she expected from her classes. In particular this teacher appreciated those questions which were based on illustrations ("they save me time"), but also commented favourably on Young and Lowry's word deletion exercises (Book 57).

Nevertheless, Teacher Ten thought that the freedom of the teacher was very important and did not like the idea of a single course textbook. She cited examples of teacher proof packages in mathematics which she alleged had failed: "a child is a human being who needs human contact to give confidence and encouragement. That can only be done by human beings." For this teacher the ideal text book would include a large number of resources with little text: "the text often approached a topic from an angle with which I was not in sympathy and was not willing to allow as the main teaching aid". Similarly, she wanted questions and activities which were in sympathy with the teacher's approach: "Young and Lowry included a wide enough approach to satisfy most teachers. That is probably why it went to a fifth edition".

When asked about the importance she placed on the development of skills in geography as opposed to the learning of factual knowledge, this teacher replied that "Geography more than most subjects shows the importance of various sources of information. My duty as a teacher is to develop the ability in pupils to interpret all those data sources. I didn't actually mind how much geography they actually learned, so long as, given a set of resources, they could make something of them". Of the influence of public examinations, she said "I am a pragmatist. If the end result of education is to be judged in terms of the number of exam passes, it is irresponsible of geography teachers to ignore this. In the fourth and fifth years, certainly, skills and concepts become luxury items. My work with the examination panel made me aware of what was needed for students to get the best grade possible".

Finally, the teacher described how her attitude to text books and teaching in general had changed since she entered the profession: "I used to produce lots of my own resources. One day I was feeling very tired and upset, and another teacher said to me 'Are you going to be a teacher twenty-four hours of the day or are you going to be a human being now and again? He was right. I made a conscious effort. I set aside one night a week to devote to lesson preparation, departmental work and syllabus reviews. I worked hard that night, but the other nights were mine. I thought if I was just a teacher, what kind of life would I have to talk about outside?"

Teacher Ten appeared to be firmly wedded to the landscape analysis paradigm of geography, and accordingly interpreted the text books at her disposal in that way. Her image of the role of the teacher as central to the learning process and director of her pupils' activities, appeared to encourage her in that approach. The text books were mainly used as sources of materials on which the teacher could base her own analyses and encourage her pupils to do likewise. When the text books proved to be inadequate to provide materials for analysis, alternatives such as atlases, Ordnance Survey maps or television programmes for schools were introduced. The various approaches to geography adopted by the authors of the books used appeared to have very little influence on the geography curriculum offered by this teacher.

CHAPTER FIVE

CONCLUSIONS TO THE STUDY

1. THE NATURE OF THE INVESTIGATION

The present study arose from the writer's perception of inconsistencies between the advice given on the contribution of text books to the teaching of geography in secondary schools by those whose role it is to advise teachers and the way in which practising teachers appeared to use books in their daily work. Previous work (Lidstone 1977) had shown that given the same text books, syllabus guidelines and parallel classes in the same school, four teachers taught markedly different geography courses. That earlier work, while identifying differences in teachers' and pupils' perceptions of their geography courses, did not identify how the text books were used nor suggest why they were used as they were. It was therefore decided to investigate the nature of the contribution of text books to geography teaching and the ways in which text books were used in some geography classes. The contribution of text books was examined:

i) through a study of the books themselves and the intentions of their authors,

ii) the relationship of the books with the abilities, needs and wishes of pupils, and

iii) the relationship of the books with the needs, beliefs and wishes of teachers.

The investigations of these contributions led to the consideration of the aims of both teachers and their pupils in geography lessons.

2. SUMMARY OF THE RESEARCH PROGRAMME

Before the study began, an investigation was made of the advice in the forewords, prefaces and introductions of a number of text books chosen to represent stages in the development of geography as a school subject in the United Kingdom. A study of the advice given on the contribution of text books to geographical education by the authors of manuals of geography teaching method and of official reports was also made.

The present study consists of illuminative investigations of the work of ten teachers. These investigations were based on the twin concepts of "instructional systems" and "learning milieux" (Parlett and Hamilton, 1976). Instructional systems include the materials on which teaching is based. The text books which formed part of the instructional system used with each class were analysed in terms of their internal presentation structure and their readability. The readability of the text books was considered both in terms of scores on the Flesch and Fry formulae whereby a nominal reading age level could be compared with the chronological ages of the pupils and in terms of cloze tests whereby the interaction of specific groups of pupils with their reading materials could be considered.

The learning milieu includes all those "cultural, social, institutional and psychological variables" which "interact in complicated ways to produce, in each class or course, a unique pattern of circumstances, pressures, customs, opinions and work styles which suffuse the teaching and learning that occur there". The learning milieux of the classes of the teachers who took part in this study were investigated in four ways. Firstly, diaries were kept by the teachers of their use of text books during each lesson for a number of weeks. Secondly, audio recordings were made by some of the teachers of lessons in which text books were used. Some teachers declined to allow such recordings to be made available. Thirdly, questionnaires were administered to the pupils which asked them to record their perceptions of the presentation structure of their text books; their perceptions of the use made of six modes of data presentation; their evaluation of the value of these modes of data presentation and their evaluation of fourteen teaching strategies which might involve the use of text books. Finally, the evidence of the studies was presented to the teachers individually as the bases for discussions on the role of the text book in that teacher's style of working.

3. THE CONTRIBUTIONS OF PREVIOUS RESEARCH STUDIES TO AN UNDERSTANDING OF THE ROLE OF GEOGRAPHY TEXT BOOKS

There has been little research into the role of text books within the area of geographical education. Those studies which have been undertaken indicate that activities based on the use of text books are amongst those least popular with pupils; that learning from text books alone is less efficient that other methods of learning and that pupils are required to read text books for only a small proportion of their geography teaching time.

There have been a considerable number of studies of the teaching-learning effectiveness of the six modes of data presentation commonly found in school text books of geography. These are written text, photographs, diagrams, maps, graphs and tables of figures. Many of these studies have concentrated on single facets of the use of the presentation modes. Some researchers who have approached the matter from an educational standpoint have investigated the effectiveness of presentation modes either singly or in combination, while researchers beginning from a psychological standpoint have investigated the ways in which the messages carried by the presentation modes are transmitted to learners and some of the reasons why this may occur.

Few researchers have examined the effectiveness of the presentation modes in situations similar to those in which they are usually encountered by pupils. A number of the tasks which researchers have used to judge the effectiveness of different modes of data presentation are not those which teachers conventionally give to their pupils. Many studies of the effectiveness of using specific modes of data presentation have shown positive results, but closer examination of the studies suggests that while positive effects may be discerned in the short term, long term results are frequently insignificant. This may be because short term studies are more easily controlled to eliminate extraneous influences while also having the advantage of novelty.

A number of studies have revealed that teachers are not always willing to construct and use innovative teaching strategies based on single modes of presentation, nor to do so in ways suggested by researchers. Furthermore, there is some evidence that pupils may resent the additional work which some innovative teaching- learning strategies entail. A number of research reports have revealed that the role of the teacher may be significant in the success or failure of innovative teaching methods. It may be suggested that the influence of the teachers reflects differences in teachers' preferred styles of teaching and the extent to which teachers have been involved in the design and implementation of experiments. In terms of increments of student learning as measured by researchers, teachers have frequently been found to implement those strategies they prefer more successfully than those with which they feel less sympathy.

It may be suggested that teaching programmes designed and implemented collaboratively by researchers and teachers have been more successful than those designed by researchers alone. Collaborative research strategies may draw on teachers' experience, reflection and daily observations. Such strategies are more likely to use teaching methods which have been found to work and they can be adjusted and refined to meet the needs of specific groups of pupils. Most successful strategies are multidimensional, involving a variety of skill objectives, teaching strategies, materials and activities in order to avoid a decline in effectiveness due to fatigue. Finally, successful strategies appear to involve high levels of teacher-pupil interaction.

The work of psychologists in examining the ways in which specific strategies operate and may assist in learning also contribute to an understanding of the role of text books. Research on reading, and specifically on the importance of schema theory, suggests that pupils understand text more readily when they receive guidance on the main ideas. This may be provided in a number of ways including advance organizers in written and oral form, clearly structured text and the use of adjunct aids. The importance of the possession of appropriate schema in achieving understanding is also implied in work which has been done on the effective use of photographs, maps, and statistical presentations.

The research shows that there is no agreement amongst researchers as to the purposes for which printed materials are provided. Some research has concentrated on the effectiveness of modes of data presentation in enabling pupils to recall substantive content either in its entirety or according to a definition of the main ideas which is presented to the learner. In such cases, it has been shown that explicit learning goals are particularly valuable when there is a discrepancy between what the teacher and the pupils perceive as being important in text. Other studies have examined the means whereby pupils may be encouraged to decide on the main message themselves or to interrogate the data source for answers to questions which they themselves have created. Both approaches to the study of the use of printed materials have resulted in recommendations on appropriate ways of planning learning programmes to achieve these different ends. No research could be found which has investigated the aims of geography teachers when they present their pupils with printed materials.

4. DRAWING CONCLUSIONS FROM CASE STUDY RESEARCH

The traditional approach to educational research has been to study specific and localised phenomena from which generalizations, with high levels of predictive reliability, may be drawn. Such broad generalizations seldom offer help to classroom practitioners who operate in the context of problems and decisions which are highly idiosyncratic. For these practitioners, the problem is how to infer the significance of research findings presented in general terms to their own situation. It is probably for this reason that classroom practitioners tend to place their faith less on educational research and more on practitioner lore based on conventional wisdom accumulated from past experience.

Case study research, on the other hand, does not permit generalizations at high levels of predictive reliability. It does offer insight into individual instances by illuminating the common sense knowledge of practitioners and the constraints under which they work. Case study enables others to generalize from the specific cases to their own experience. Generalization is not the principal task of case study researchers, but of their audiences. Walker (1974) wrote: "The problem of generalization ceases to become a problem for the author. It is the reader who has to ask, 'what is there in this study that I can apply to my own situation, and what clearly does not apply?'"

In the present study, the writer has attempted to present each teacher's approach to his or her role and the contribution of text books to that role in such a way that the reader may imagine the situations in which each teacher is working and appreciate the motivations which lie behind his or her decisions. This is done in order to create what Simons (1980) has called "empathetic understanding", although this does not imply either acceptance by the reader of the explanations advanced by participants for their actions and decisions, nor, necessarily, approval of them.

Stake (1974) suggested that simply sharing the experience of a setting to allow readers to make their own evaluations of it may often be a sufficient goal of illuminative case study research.

The purposes of case study research may go further than this. Implicit in the use of case study is the notion that there is no true definition of the situation. The case study worker acts as "a collector of definitions, not the conductor of truth" (Walker, 1974, p. 58). Since the most important feature of case study is that it is pursued through a social process involving the researcher and the participants, and leads to a social product, the case study worker may help his or her readers to appreciate the interactions between the cases and the study by making his or her own interpretations accessible to the reader.

And this is not all. Despite their diversity, the individual classrooms described in this study share many characteristics which may be related to the wider findings of educational research. The relationships between classes and teachers, the processes adopted within individual classrooms and phenomena observed across a number of classrooms may all be examined in the light of this wider research and may indicate areas in which further research may be undertaken.

In summary, the case studies presented in Chapter Four may be interpreted in three ways. Firstly, the reader may judge the validity of the study by comparing the accounts given with his or her own experiences and in the light of the description of the methodology adopted which was presented in Chapter Four. The validity of the study in this sense is, then, to be judged in terms of the extent to which the reader can empathise with each teacher in his or her endeavours, and understand the reasons for his or her actions. Secondly, the case study researcher may indicate his own interpretations of the studies reported in order that readers may consider their own understandings in the light of the comments made. Thirdly, the accounts may be regarded as studies of "human systems in their natural settings" (Diesing 1971, p. 137). Each may then be examined in the light of wider research in an attempt to generate explanations which make more general sense of the set of events described. While generalizations with high levels of predictive validity may not be drawn from the actions of the ten teachers who participated in the study, generalised principles may be suggested against which each of the cases studied may be judged in a search for further explanations. It is the second and third approaches which will be adopted in the section to follow. It is the prerogative of the reader to indulge in the first approach.

5. THE ROLE OF TEXT BOOKS IN THE WORK OF THE TEN TEACHERS.

The present study has investigated the role of text books in geography teaching. The research strategy adopted placed great emphasis on the accounts and interpretations of a number of teachers, especially as expressed in discussion-interviews. These discussions led the writer to perceive that most of the teachers have a number of aims for their teaching. These aims include ensuring that their pupils acquire factual knowledge, achieve examination success and gain understandings of certain aspects of the world in which they are growing up. This diversity of aims led many of the teachers to state that they want their pupils to be capable of independent analysis of geographical materials, while feeling under an obligation to ensure that they reach the "right" decision in terms of the teacher's perceptions of the subject. Despite this interest in their pupils' independent analysis, they also felt constrained to complete 'topics' with the same economy of time as might be expected from an expository lesson.

Some of the teachers perceived the inconsistencies between their aims and the teaching methods they adopted. Those who did not perceive any inconsistency or did not express any uncertainty were often those who had the most limited views of the aims of geographical education. Those who did perceive an inconsistency were frequently influenced by the apparent contradiction between the advice promulgated by some "expert" curriculum developers and their own classroom observations, experiences and expectations about what would "work" with their classes.

Whatever their particular viewpoints on their aims and methods, many of the teachers felt constrained in what they could hope to achieve by the conditions under which they were working. These constraints may be classified as relating either to the pupils and their abilities, attitudes and expectations; the materials, including text books, with which the teacher had to work; or the institutional constraints in terms of school organization, work loads and expectations of the teacher by those in authority. In the face of such constraints, most of the teachers adopted a pragmatic approach to their work, maintaining their aims but accepting that those aims were unlikely to be achieved in their entirety. Some regretted what they perceived to be their own inadequate performances, but being concerned that work should not be allowed to take over the whole of their lives, engaged in a process of rationalization, emphasising the constraints.

In terms of the use of text books, pupils in each individual classroom confirmed the findings of earlier researchers that text book based activities are neither popular nor valued. For the majority of the teachers in this study, text books are a major source of inspiration, content information and resources. While many of the teachers regarded the text books as aides memoires in respect of factual content, for others they were a primary source. The text book was not regarded by many of these teachers as the most suitable source of questions and activities and those who eschewed the use of text book questions and activities frequently explained that they were inappropriate for their pupils in terms of the pupils' needs or abilities. It also appeared that for many of the teachers, the completion of questions and activities by their pupils served the purpose of reinforcement of the interpretation of the topic which had been presented by the teacher. This attitude illustrated the conflict referred to earlier concerning the role of the teacher. For most of the teachers, the interpretation of the topic was seen as their own prerogative, not to be abrogated by the author of the text book. In a number of cases it appeared that those teachers who did use questions and activities from a text book offered their pupils a much greater range of experiences than those who did not.

Most of the teachers who participated in the study selected a majority of experiential questions and activities for their pupils to complete. These questions, based on pupils' direct experience of materials other than written text mainly required pupils to make confirming statements about the information contained in the materials with no evidence of further interpretations. Teachers who selected a majority of experiential questions and activities also frequently used non-experiential questions and activities which demanded higher levels of cognitive processing than those teachers who selected a majority of non-experiential questions. This latter group of teachers were also those who placed greatest emphasis on the factual content acquisition aspect of geography teaching. That the majority of the ten teachers participating in this study, most of whom would describe themselves as among the more conservative members of their profession, place such emphasis on experiential questions and activities may be taken as a source of comfort by those who consider that school geography is still typified by the mindless memorization of received facts.

For all the participating teachers, it was very rare for pupils to be expected to read their text books alone without teacher help. The reasons given for this were sometimes related to the reading abilities of the pupil, but more often referred to the perceived inabilities of the pupils to select those aspects of the text which the teacher considered to be important. It has frequently been suggested by various researchers that pupils are not asked to read in class because the reading materials in school text books are too difficult for them. The results of the descriptions of classrooms in this study would suggest that pupils are not asked to read in class because their teachers do not consider reading to be an effective teaching strategy to adopt to achieve their aims. Many of the teachers acknowledged that reading for understanding was an important educational aim, and considered that reading the books with their pupils and discussing their contents, or presenting the main points of the topic in advance of the pupils' reading, was an appropriate strategy to adopt in pursuit of this aim. Although some of the teachers considered that they would require more private reading from their pupils if books at a lower level of readability were available, the majority did not consider that reading ability or readability was an issue. They regarded independent critical reading to be but one of their aims of geography teaching and one which would develop in their pupils by tutelage and increasing knowledge of the world.

In discussing the use of the other modes of data presentation, only diagrams were perceived by these teachers as being of great significance for expository purposes, although they were rarely used as the bases for questions and activities. Photographs, frequently assessed by pupils as being of considerable value for their learning, were also perceived as being used relatively rarely in lessons. The responses of the teachers to this finding were often as equivocal as the pupils' responses. A number of the teachers made considerable use of photographs, almost always by discussing them orally with their pupils. The majority described photographs as being important, but admitted that they did not play a major role in their teaching. Many of the groups of pupils also expressed high valuations for the role of photographs as learning aids, while perceiving that they played a minor role in geography lessons. The reasons for the minor role played by photographs ranged from perceived weaknesses in the quality of photographs presented in the text books, especially regarding size, clarity and relevance of the subject, to institutional constraints on the use of projected materials.

Diagrams of all types were valued by the pupils in the classes studied and both teachers and pupils regarded them as making a major contribution to geography teaching. The teachers praised text book diagrams for their clarity and effectiveness in portraying many kinds of systems and in presenting the essence of physical features simply. It appeared that the teachers were able to talk their classes through diagramatic presentation in ways which enabled pupils to grasp the essential relationships and elements which were the teachers' main learning objectives.

While many of the teachers in this study expressed considerable enthusiasm for the clarity and simplicity of diagrams, maps were described in less favourable terms. Many of the teachers explained that the maps available to them were very complex and that their pupils found great difficulty in working from them at any but the most basic levels. For many of these teachers, map use was a skill to be taught for examination purposes only. Only one of the teachers used Ordnance Survey maps as a major resource in his teaching of regional and physical geography. This teacher began the teaching of the skills of map use at an early stage in his pupils' secondary school career and gave maps great prominence throughout the five years of the course. It may be suggested that in according such prominence to map work, other aspects of geography which may be more highly regarded by other teachers were neglected. The value accorded to maps by the various groups of pupils varied according to the emphasis placed on Ordnance Survey maps in their geography course. It would appear that the evaluations accorded to maps in their responses to the questionnaire reflect the pupils' perceptions of map study as an end in itself rather than as a contributor to geographic learning. Text book maps in general received little comment perhaps implying, as Bartz (1970b) suggested, that the maps commonly found in text books contain very little information to communicate.

The use of statistics, both in the form of graphs and tables of figures was regarded in a different way to other aspects of geography by the teachers in this study. Almost all the teachers spoke of the importance of pupils appreciating the ways in which politicians and media presentations misuse statistics in order to mislead their audiences. Geography was seen by the teachers to be the only subject area to address the matter of the use of statistics. Although they often used statistical charts and diagrams as the basis of class discussion and oral work, many of the teachers in the study expressed the view that pupils may best learn how to interpret statistics by undertaking their own statistical manipulations and transformations. Despite the positive attitudes to statistics adopted by teachers, the evidence of the pupils suggests that their use played a small part in their geography lessons. The less favourable evaluations generally accorded to the use of statistics by the pupils may reflect a preference for teachers' interpretations of events rather than their own.

The overall impression of the attitude of these teachers to the use of text books is one in which the teachers use the text books to support their own interpretations of the nature of the subject, employing whichever books may be available, regardless of the specific structure of geography or teaching style suggested by the author of the book. The less confident of the participating teachers in their interpretations of the subject made greater use of the structure offered by the text books, although even these teachers selected from amongst a number of text books. Those teachers who taught from a single text book offered their pupils a greater range of resources and learning activities than those who selected from amongst a range of text books. All the teachers in this study considered that the teacher's main role is to teach, by which they appeared to mean giving close guidance to their pupils both in methods of learning and the content to be learned. The teachers and their classes were generally agreed that close teacher-pupil interaction was of the greatest value in the teaching-learning endeavour.

6. THESE TEACHERS' USE OF TEXT BOOKS INTERPRETED IN THE LIGHT OF RESEARCH ON LEARNING FROM PRINTED MATERIALS

Peters (1982) suggested that investigations into the use of printed materials in schools should be based on a text-reader-teacher interactive model as opposed to the text-reader model which appears to be the basis of much research. He stated that it is the teacher who augments the learning process by providing the student with the necessary focus and structure.

The teaching-learning strategies described in this study have generally been explained by the teachers in terms of their past experiences and their perceived constraints or hunches about what will 'work' with their particular classes in their attempts to achieve their aims. The approaches adopted by the teachers may also be interpreted in the light of research into learning from printed materials. At first sight this may appear to be post hoc rationalization. It is contended that such interpretations of case study illuminative research are justified firstly as lending ecological validity to the research and secondly as relating to the applicability of research to the real world of the classroom.

In the first case, reviews of research frequently reveal findings which are equivocal from one study to another. These differences in findings stem mainly from the fact that different institutional constraints are controlled or uncontrolled from one experiment to another. It may at first be tempting to conclude that the research is inconclusive due to a lack of rigour, but when related to the highly interactive environments of classrooms, such inconsistencies may be regarded as the inevitable concomitants of work in such complex areas. Illuminative research then takes the role of validating basic research in a variety of classroom ecologies.

In the second case, it would be surprising if research were to reach conclusions which are not in accord with the intuition of those who are masters of their craft. There does not seem to be any good reason why research should present surprises. Rather, it may be expected to support practitioner intuitions and perhaps offer explanations for behaviours which have been found to be most expedient in specific circumstances. If this second contention about the relationship of basic research and illuminative research is accepted, then the basic research may be expected to add credibility to existing classroom practices.

The rest of this section relates the pattern of text book use as revealed by the case studies of the teachers who participated in the study to the research reviewed in Chapter Two and summarized in Section 5 of the present chapter.

Many of the case study teachers devoted considerable amounts of time in those lessons in which text books were used, to reading through the text with their pupils or examining and describing the graphics, emphasising those aspects which the teacher thought to be of greatest significance and questioning the pupils to ensure that each stage in the interpretation was understood. Perfetti (1977) and Pearson and Johnson (1978) point out that unfamiliar words require more processing by pupils and so reduce the amount of attention which the reader can give to comprehension. Furthermore, Trabasso (1981) says that without an understanding of the basic concepts in a text or questions, a reader cannot make inferential links between the content of a text and previously learned knowledge. It might be suggested that teachers could instruct their pupils in the meaning of technical terms to be encountered in the text and then allow the pupils to approach the text themselves. Nitsch (1977) states that the learning of vocabulary in restricted contexts limits the ability of a reader to use the words in novel contexts later, while Beck et al. (1982) refer to the importance of "automaticity of lexical access" in ensuring that pupils know the meanings of words in a number of contexts. By reviewing the text book information with their pupils, the teachers in the present study are able to ensure that vocabulary difficulties are minimized and that the concepts required for the appropriate interpretations of the text in terms of the teacher's learning goals are possessed. In this way, teachers overcome the difficulties in pupils' use of text books which are implied by the work of Milburn (1972), Evans (1974, 1975, 1976) and Johnstone (1978). Furthermore, by reading the book with their pupils, teachers may assist their pupils through the use of intonation. The importance of intonation in the interpretation of text receives comment from Perera (1979).

In addition to the need for pupils to understand the meanings of technical words and concepts as applied in particular passages, a number of researchers have investigated the importance of readers appreciating the underlying logical structure of passages of text. It has been shown that those passages which are organized according to an underlying logical structure are more easily remembered than arbitrary sequences or disorganized passages. In the context of teachers' uses of text books with their pupils, this work has application in two ways. Firstly, while narrative prose is usually written according to a predictable sequential structure, a number of researchers, including Kucera (1980), have shown that expository text may be written with any one of a large number of possible hierarchical structures, and that the hierarchical structure of main ideas and supporting details is text-specific. Even when faced with a single book written with a consistent internal structure, pupils may have considerable difficulty in identifying the structure adopted by the author. Secondly, the present study shows that a number of the teachers studied use more than one text book with each class.

Furthermore, nearly all the teachers emphasized that they did not want to be bound by the interpretation of any topic by the author of a text book. Thus, their pupils have to deal not only with several books each of which is likely to be structured in a number of different ways, but with situations in which their teacher requires them to read the book in support of an approach to the topic which may be considerably at odds with that intended by the author when he or she originally structured the writing. It has been shown by Kintsch and Van Dyke (1978) that readers cannot remember everything in a text and must therefore form a "macrostructure" or "gist" of the important ideas to be remembered to act as prompts for the detail of the text content. When teachers introduce a topic orally and then proceed to read textual passages with their classes, clarifying concepts and structures, they are in effect assisting their pupils to construct macrostructures appropriate to the teachers' interpretation of the topic, and helping their pupils to override the structures internal to the expository text which may not be appropriate to the intentions of the teachers.

Much research on text structures has concentrated on structured overviews, prior organizers, advance organizers, pre-reading experiences and three level guides, most of which have been shown to have beneficial effects on recall. Similarly, the placement of questions before or after a reading experience has been shown to have a significant effect on types of recall. Rothkopf (1982) has emphasized that the use of questions in guiding pupils' learning is especially beneficial when posed by "a teacher-like figure". He also suggested that the use of questions in this way is particularly relevant when the teacher is unable to describe learning goals specifically as is usually the case in social science and other subjects other than the physical sciences and mathematics.

The teachers' role in creating structures for their pupils may also be seen in the context of the research on typographic cueing. It has been shown that multiple typographic cueing, especially for less able pupils, may cause confusion. This confusion is likely to be multiplied in situations where teachers wish to use a number of different text books, each of which adopt different typographic conventions. In such situations, the role of teachers in providing their pupils with appropriate structures, cues and questions will be essential, and may be effective to the extent that Lidstone (1977) found that many pupils were not even aware of typographic differences within the materials with which they were asked to work.

In addition to work on vocabulary and the structure of text, students of reading have also investigated the importance of inference. Johnston and Pearson (1982) have pointed out that "writers always omit from their presentation precisely that information they think readers will be able to fill in (i.e. infer) on their own. Serious mismatches in comprehension can occur when the information the author assumes the reader will fill in is not the same as that which the reader possesses". This comment supports the views expressed by Pearson and Camperell that pupils need assistance with textual structure, especially when they are on the periphery of their prior knowledge of the topic. The role of teachers as guides to their pupils in the reading of text may help to prevent some mismatches and to ensure that the inferences which the teacher wishes his or her pupils to draw are in fact drawn. Although there is always the danger that such assistance may create in pupils a continuing need for such help, ensuring sustained dependency rather than progressive independency in their reading, the warning of Langer (1982) that young or poor readers lack "metacomprehension" or understanding of their own cognitive processes and so are less likely to seek clarification of poorly understood material, must be considered. Constant teacher assistance and questioning helps to combat this problem, and is, in any case, consistent with the view, expressed by many of the teachers, that the main role of the geography teacher is to guide pupils towards the understanding of geographical ideas rather than to help them to improve their skills of reading.

Rothkopf (1982) offered research evidence that providing pupils with descriptions of the information to be elicited from text had a marked effect of the recall of "goal specific" information from the text. This was found to be especially so when the statement of intent used relevant lexical features from the text. These findings are reflected in the accounts of the teaching styles adopted by the teachers in this study who based their own expositions closely on those of the text book authors. It may be suggested that by basing their own expositions closely on those of the text book, the teachers ensured that pupils have the greatest possible opportunity to remember the information emphasized and to complete questions and activities which require confirmation of information presented in some other format.

It was suggested in Section 5 of this chapter that the teachers in the present study appeared to value diagrams most highly for illustrating their expositions, but regarded maps and photographs as frequently too complex for pupils to use effectively. The pupils in the study perceived photographs to be used but rarely, but regarded them as being of high value in their learning. Salomon (1979) suggested that the most important attribute of the various media is terms of learning and cognition are their ways of structuring and presenting information, while Knowlton (1966) pointed out that "logical pictures" (diagrams) have the greatest potential for signifying relationships or structure while "realistic" pictures (photographs or paintings) are of greatest worth in portraying scenes of inherent interest, aesthetic worth or dramatic impact. According to Knowlton, realistic pictures "say too much" by providing the viewer with cues that are "irrelevant" to the purpose of the communication. The teachers in the present study considered the acquisition of abstract concepts to be of greatest significance in their geography teaching, and many stated that the values aspects of geography played little part in their teaching. While "aesthetic worth and dramatic impact" are not the only reasons for the inclusion of photographs in geography lessons, the apparent view of some of the teachers in the present study that such matters are of low priority in geography teaching may account in part for the low use of photographs. Those teachers who claimed to include photographs regularly in their lessons mainly used them orally with their classes and found it necessary to discuss them in some detail and question pupils in order to guide their pupils to those features they, the teachers, felt to be of greatest geographical significance. The need for guided enquiry in the use of photographs in geography was one of the main findings of Long (1953, 1961). Furthermore, many of the teachers who participated in the present study pointed to the need to give pupils a mental picture of the concepts being taught. They implied that once the concept had been acquired by pupils with the help of a photograph, then the photograph could be dispensed with as a medium of communication. In this, the teachers appeared to be offering support to the suggestion of Levie and Dickie (1973) that while pictures can be used to teach a concept, words may be more effective in communicating a concept which has already been learned.

Dwyer (1972) shows that single line drawings are more effective than photographs when subjects are taught as a whole class. The preference of

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many of the teachers in the present study for diagrams to illustrate their expositions was frequently explained by the teachers themselves in terms of greater ease of understanding by pupils and a lack of confusing peripheral detail. The suggestion by Dwyer that while line drawings are more effective when the class is taught as a whole, photographs may be more appropriate for self paced instruction because they would then have more time available to interact with the visual, would not seem to be supported either by Long's work (1953, 1961) or the responses of the teachers in the present study. The advantages of structural diagrams would seem to be shared with flow diagrams which illustrate processes and which were also mentioned by a number of the teachers as assisting pupil understanding by portraying essential elements without distracting peripheral detail.

Sandford (1979) commented that maps can be interpreted by a process akin to "reading between the lines". The lack of ability of many pupils to draw inferences from maps has been attributed to the complexity of many maps. Bartz (1970b) commented that most maps for classroom use try to make too many points, leading to pupils misreading them due to significant information being lost in the mass of other detail. The poor map reading ability of many pupils may be considered to share some of the features of poor text reading ability. In the text reading context it was suggested that pupils who have difficulty with the meaning of individual words cannot attend to the meaning of the whole passage. It may be considered that the teachers who concentrated on teaching map reading skills to their pupils as a separate topic from their work in other areas of geography are tacitly agreeing with this suggestion.

The use of graphs and tables of figures is not regarded highly by these pupils, nor is it perceived as being of major importance in the geography lessons of most classes. The teachers in the present study consider that the interpretation of statistics is an important skill for pupils to learn, and a majority of these teachers consider that talking with pupils and guiding their interpretations by questioning is the most appropriate technique to adopt in developing this skill. No specific research on the use of statistics in school contexts was found, but the comments of Macdonald-Ross (1977b) that all the numerical graphic formats are most effective in communicating their message when accompanied by text which should direct, comment, explain and question may be considered to support the emphasis of many of the ten teachers on the importance of discussing statistical information with their pupils to ensure their correct interpretation.

The examination of the teaching strategies frequently adopted by the teachers in the present study in the light of research into learning from printed materials suggests that these teachers are providing much help which is relevant to their pupils' learning from their text books. The research reviewed in Chapter Two suggests that when the teacher's perception of the main ideas to be learned from the topic match the author's perception of the main ideas, such strategies may be very effective. There seems to be little evidence that some of the teachers attempt to create this match and in fact some specifically stated that they approached various topics in direct opposition to the author's conception of the main ideas. Research would suggest that this may be very confusing for many pupils, especially those who are less able. Furthermore, the pupils are given little opportunity to practise the skills of independent learning which were claimed by many of the teachers to be one of their aims of geographical education.

7. THE LIMITATIONS OF THE STUDY

This study set out to investigate the ways in which a group of teachers use text books in their geography teaching and the reasons which lie behind their decisions. It was explained in Chapter Four that using impartial observers in the classrooms to collect data on the actual use made of text books was not practicable. The presence of observers in classrooms has been shown to affect the behaviour of teachers (Samph, 1979). However, the alternative adopted in this study of asking teachers to act as their own observers by keeping diaries, with the responses of their pupils and limited provision of audio recordings of lessons being used to validate the diary records, may be regarded as giving a potentially biased account of the events which actually occurred in the classrooms. It must be added in this respect that the high degree of correspondence between the three accounts of classroom activities and the teachers' own comments during the discussion-interview suggests that the accounts given of the uses made of text books in the individual case study reports have a high degree of validity.

The reliance on pupils and teachers to complete and administer the instruments employed in the study meant that the taxonomies adopted had to be made sufficiently simple to cause minimal interference with normal classroom routines. There was no time to train teachers in more complex methods of classifying the various types of graphic presentations used, neither was it possible to adopt systems to record the type and use of teacher initiated oral questions other than through the use of audio recording. Similarly, the interactions between teachers and individual or small groups of pupils were not recorded in detail by any of the instruments adopted.

To have adopted more complex techniques would have necessitated higher levels of instruction or training of the participating teachers. There is no way of evaluating the ways in which this would have made the teachers self conscious of their craft and thus have affected their classroom performance. It was suggested in Chapter Three that even keeping the diary exerted an influence on the teaching style of some teachers.

Perhaps the greatest weakness in the research strategy adopted stems from the inability of the researcher to determine the extent to which the explanations for their actions offered by the teachers were prompted by the nature of the enquiries made. Furthermore, the interest of the researcher may have encouraged rationalization on the part of the teachers in an attempt to explain actions for which there was no explanation or for which the teachers were unwilling to reveal the true explanations. The validity of the explanations offered may only be judged in terms of their face validity and the internal consistency of the explanations offered by each individual teacher.

In view of the finding early in the study that most of the participating teachers usually adopted whole class styles of teaching, it was decided that investigations of the precise levels of pupils' cognitive abilities should not be undertaken. Similarly, no attempt was made to investigate the cognitive styles of the pupils since there was no evidence that the teachers altered their teaching styles according to different cognitive styles of their pupils. Indeed, there appeared to be little attempt on the part of the teachers to make allowances for any individual differences in the learning abilities or preferred learning styles of their pupils other than at the whole class level. Finally, no attempt was made to investigate possible differences in the cognitive abilities or cognitive styles of the participating teachers. Such an attempt may have changed the co-operative relationship between researcher and participating teachers adversely.

8. IMPLICATIONS OF THE STUDY

In this study the researcher has concentrated on eliciting accounts of the ways in which text books have contributed to the teaching of geography by ten teachers and the reasons for their use. In investigating the teachers' reasons for their use of text books, attention was paid to the aims of these teachers in teaching geography and the methods they adopt to achieve their aims. The issue of the appropriateness and validity of these aims for geographical education in the late 1980s has not been addressed.

The study suggests that the teachers who participated are generally adopting teaching methods which appear to be effective in achieving aims of geographical education which are held by the teachers as individuals. It is difficult to discern common aims across even as small a group as the ten teachers who participated in this study. Where the teachers in the study are failing to achieve their aims, it would frequently appear to be for institutional reasons. For the teachers, these may be summarized as including too much work, not enough time and too few resources.

The study also has implications for wider issues of curriculum development. The ten teachers whose work has been examined may not have formulated their aims in the teaching of geography explicitly before their participation in this study. Nevertheless, when asked to explain their decisions regarding their selection of resources and activities for their pupils, most were able to offer clear statements of these aims. The evidence of diaries, audio recordings and pupil responses generally supported these statements as genuine aims and not hastily constructed rationalizations.

Given their aims, the teachers appeared to select resources and activities from the text books to support their work towards the achievement of these aims. This is not to suggest that the content and structure of the text books were negligible in their effects, but rather that they were interpreted in the light of teachers' existing ideas on the nature and scope of geography teaching and the constraints under which they perceived themselves to work. Central to the issue of curriculum development for these geography teachers is not, as the writer anticipated at the beginning of the study, the provision of appropriate teaching materials in the form of text books, but their personal decisions on the fundamental aims of geographical education and the methods which should be adopted to achieve those aims. Currently, for the teachers in this study, aims are decided by the individual teachers influenced by the syllabuses of the public examinations and the resources at their disposal. It appears that much of the public discussion about the aims and methods of geographical education which has taken place over the past two decades has either made little impact of some of these teachers or has been percieved as irrelevant and its conclusions have been rejected.

The writer began the present study by citing Parlett and Hamilton's distinction (1976) between the "instructional system" and the "learning milieu", in which the latter was defined as operating primarily at the classroom level. The writer pointed out that no mention was made by Parlett and Hamilton of potential effects of instructional systems on learning milieux. The case studies presented here suggest that, for these teachers, the learning milieu is influenced only slightly by the teaching materials, including text books, available to them. Several of the teachers indicated that of much greater importance in creating a disparity between their declared aims of geographical education and the teaching methods they adopt, are the institutional constraints within which they work. It is suggested that further research should be carried out to investigate the precise nature of the constraints which are perceived by teachers to prevent them from achieving their aims and to suggest ways in which such constraints may be modified within the wider constraints of penurious education systems in the latter years of the twentieth century.

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APPENDICES

BOOKS AND ARTICLES EXAMINED IN AN INVESTIGATION OF THE ADVICE GIVEN TO TEACHERS ON THE USE OF TEXT BOOKS

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SELECTION OF CLASSES

School: ....

Teacher: ....

Details of classes taught

Class	Group Type (1)	Text books used with class since September (Title + Author)	Usage (2)	H.W. (3)	No. of lessons (4)	X
		(please continue overleaf)				

Notes: Please code as follows -

1. Group Type: A - mixed ability across year group
   B - mixed ability within band
   C - set
   D - stream
   E - other method of grouping for geography lessons
2. Usage of books: A - book used by pupils for the whole year's course
   B - book used by pupils for part of course (½ - 1½ terms)
   C - book used by pupils for a single topic (up to ½ a term)
   D - book used by pupils for a single lesson or small group of lessons (up to 2 weeks) at intervals during year
3. H.W.: Please mark with a tick those books issued to pupils which may be taken home for homework purposes.
4. No. of lessons: Please indicate the number of lessons of geography each week and the length of each lesson e.g. 2 x 30 mins + 1 x 60 mins.

X : see overleaf.

Details of classes taught (continued)

Class	Group Type (1)	Text books used with class since September (Title + Author)	Usage (2)	H.W. (3)	No. of lessons (4)	X

For how many classes would you be willing to keep a record of geography lessons?

Please ring 1 : 2 : 3 : 4 : 5 : 6

N.B. The record of each lesson will consist of a simple questionnaire which will take 3 - 4 minutes to complete at the end of each lesson. Questionnaires for each class will be supplied in a booklet.

In order that I may obtain as wide a range of classes and text books as possible, I should be grateful if you would allow me to select from among those classes listed above. However, if there are any classes you would prefer NOT to be chosen, please indicate these with a cross in the column marked 'X'.

Are you willing to tape record a representative sample of lessons in order that the oral use of the text book and the pupils' verbal response may be assessed? (I promise that the tape will be for my ears only!) Yes / No

Do you have a cassette recorder available? (I will supply cassettes) Yes / No

Thank you for your help
John Lidstone.

University of London Institute of Education
Bedford Way, London WC1H 0AL   Telephone 01 636 1500

Director   William Taylor BSc Econ, PhD, DSc, FCP   Deputy Director   Professor Denis Lawton BA, PhD

Department of Geography
Head of Department   Professor Norman Graves BSc Econ, MA, PhD

A SURVEY OF THE WAYS IN WHICH GEOGRAPHY TEXT BOOKS ARE USED IN SELECTED CLASSROOMS

undertaken by

JOHN G LIDSTONE

supervised by

PROFESSOR N. J. GRAVES

If you have any queries about
this survey, please telephone
01 - 398 - 5026

When completed,
please return to:

John G. Lidstone,
27, Oaks Way,
Ditton Hill,
Surbiton, Surrey.

I am attempting to discover the extent to which existing geography text books written for the 11 - 16 age group are appropriate to the needs of pupils and their teachers.

I hope to do this by working with a small group of teachers to analyse how individual text books are used with specific classes and the reactions of teachers and their pupils to the various methods of encouraging learning presented by the authors of those books.

You have kindly expressed a willingness to assist and I should be grateful for your help in the following ways:

1. help me to choose suitable classes from among those you teach, preferably of different ages, and keep a record of each of their geography lessons during the Summer Term - this should not take more than 3 - 4 minutes at the end of each lesson;
2. if possible, take a cassette recording of a few lessons - for my ears only!
3. administer a questionnaire in school time to each class involved towards the end of the study period;
4. spare me some time to discuss the significance of our findings.

I, in my turn, undertake to feed back all my findings to you, to use as you see fit. I shall not reveal to a third party any findings which can be attributed to a specific school or individual.

Class: .... Date: .... Lesson length: ....

Text books available during this lesson) ....

....

WHOLE CLASS ACTIVITY (if applicable)

In teaching this lesson, did you:

1. Teach the lesson without reference to any text book by pupils? Yes/No

2. Summarize and explain the topic yourself, referring to the following from the text book (please specify by page/fig. no.): Yes/No

   Text .... Map .... Graph ....

   Photo .... Diagram .... Table ....

3. Read through the author's explanation with the class, helping where necessary with difficult words/ideas and questioning pupils to ensure that they understand the information presented, but without adding substantially to the author's explanation of the topic Yes/No

   If 'Yes', sections read through: from .... to ....

4. In either summarizing the topic yourself or reading through the author's explanation with the class, did you engage in extensive questioning explanation or discussion of your pupils' understanding of, or opinions related to the topic but adding to or developing further the explanation offered by the author as portrayed in (please specify page/fig. no.):

   Text .... Map .... Graph ....

   Photo .... Diagram .... Table ....

   Please describe the additions you felt necessary: ....

   ....

5. Did you use any of the questions or tasks suggested by the author orally with your pupils? Yes/No

   If 'Yes', please specify page/question nos.: ....

6. Did you summarize features from the book's text maps, etc., for pupils e.g. by listing main points or key words on the blackboard; drawing and annotating sketch maps, graphs etc. on the b/b; dictating notes; or other method of adapting information in the book to make it more accessible for your pupils? Yes/No

   If 'Yes', please specify your method: ....

   ....

Other teaching resources used: ....

General topic of lesson: ....

Week No.: .... Lesson recorded: ....

INDIVIDUAL or GROUP PUPIL ACTIVITY (if applicable)

During this lesson, were pupils asked to:

1. Study part of the book alone, i.e. without teacher help? Yes/No

   If 'Yes', please specify pages/paras/sections: ....

   ....

   Was this part of the text studied: (tick)

   - before teacher explanation or class discussion of the topic ☐
   - after teacher explanation or class discussion of the topic ☐
   - without explanation or discussion of the topic of the passage ☐

2. Carry out activities or answer questions suggested by the author either within the text or at the end of the section being studied:

   -in writing? Yes/No

   -orally in groups? Yes/No

   If 'Yes', please specify pages/question nos.: ....

3. Copy part of the text book? If 'Yes', please specify page/fig.no. Yes/No

   Text .... Map .... Graph ....

   Photo .... Diagram .... Table ....

4. Carry out tasks or answer questions created by the teacher:

   -in writing? Yes/No

   -orally in groups? Yes/No

   If 'Yes' to either part above, please state your instruction below or if more convenient insert a copy of worksheet dated as this lesson.

   ....

   ....

5. Was Homework set following this lesson? Yes/No

   Do pupils have a text book available for homework? Yes/No

   Please state homework instructions, naming text book if different from that named above.

   ....

   ....

Thank you.

University of London Institute of Education
Bedford Way, London WC1H 0AL Telephone 01 636 1500

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You are one of about a thousand pupils who are being asked to give their views on the geography text books they have used in school or for homework.

The survey has four sections. Your teacher will read through the instructions for each section with you. When you are told to give your answers, please work through the section fairly quickly, without looking back and forth through the other questions. If you make a mistake, put a cross (X) through the answer you do NOT want to give, and then put in your new answer. When you have finished the section, wait until your teacher has read through the next instructions before going on.

Your teacher will tell you what to write in the boxes below.

Thank you for filling in this survey. I hope your teacher will be able to tell you what your class as a whole thinks of the books you have used next term.

Identity No. (leave blank) ☐☐☐1
School/Class No. ☐☐☐
Teacher No. ☐☐
Year of school ☐
Sex of pupil (Boy = 1; Girl = 2) ☐

APPENDIX D.

Section One.

INSTRUCTION:

Your geography text book(s) include some or all of the following ways of giving you information:

graphs; photographs; tables of figures; maps; diagrams; written descriptions.

Some books have a lot of writing and only a few graphs, others have many photographs and only a few maps or a little writing.

Your teacher will remind you of the book or books you have used most during this year. For each book, please say whether you think that the author has used each way of giving you information a lot, or not at all, or something in between.

Do this by drawing a circle around one of the numbers beside each way of giving you information. The meaning of the numbers is as follows:

1 = used a lot 2 = used quite a lot 3 = used sometimes
4 = used only a few times 5 = not used at all

Book One

Written description	1	2	3	4	5	☐
Photographs	1	2	3	4	5	☐
Maps	1	2	3	4	5	☐
Diagrams	1	2	3	4	5	☐
Graphs	1	2	3	4	5	☐
Tables of figures	1	2	3	4	5	☐

Book Two

Written description	1	2	3	4	5	☐
Photographs	1	2	3	4	5	☐
Maps	1	2	3	4	5	☐
Diagrams	1	2	3	4	5	☐
Graphs	1	2	3	4	5	☐
Tables of figures	1	2	3	4	5	☐

5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand. ☐

Interesting ___:___:___:___:___ Boring ☐
Unimportant ___:___:___:___:___ Important ☐
Fast ___:___:___:___:___ Slow ☐
Pleasant ___:___:___:___:___ Unpleasant ☐
Strong ___:___:___:___:___ Weak ☐
Unhelpful ___:___:___:___:___ Helpful ☐

6. You are asked to answer some of the questions or do some of the tasks set in the book in your exercise books or on paper. ☐

Boring ___:___:___:___:___ Interesting ☐
Unimportant ___:___:___:___:___ Important ☐
Fast ___:___:___:___:___ Slow ☐
Pleasant ___:___:___:___:___ Unpleasant ☐
Weak ___:___:___:___:___ Strong ☐
Helpful ___:___:___:___:___ Unhelpful ☐

7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper. ☐

Interesting ___:___:___:___:___ Boring ☐
Unimportant ___:___:___:___:___ Important ☐
Fast ___:___:___:___:___ Slow ☐
Unpleasant ___:___:___:___:___ Pleasant ☐
Weak ___:___:___:___:___ Strong ☐
Unhelpful ___:___:___:___:___ Helpful ☐

8. You are asked to explain some part of the topic in your own words or write an essay about it. ☐

Boring ___:___:___:___:___ Interesting ☐
Important ___:___:___:___:___ Unimportant ☐
Fast ___:___:___:___:___ Slow ☐
Unpleasant ___:___:___:___:___ Pleasant ☐
Weak ___:___:___:___:___ Strong ☐
Helpful ___:___:___:___:___ Unhelpful ☐

9. Pupils in the class discuss what has been studied with the teacher. ☐

Boring ___:___:___:___:___ Interesting ☐
Important ___:___:___:___:___ Unimportant ☐
Slow ___:___:___:___:___ Fast ☐
Unpleasant ___:___:___:___:___ Pleasant ☐
Weak ___:___:___:___:___ Strong ☐
Helpful ___:___:___:___:___ Unhelpful ☐

10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done. ☐

Interesting ___:___:___:___:___ Boring ☐
Unimportant ___:___:___:___:___ Important ☐
Fast ___:___:___:___:___ Slow ☐
Unpleasant ___:___:___:___:___ Pleasant ☐
Weak ___:___:___:___:___ Strong ☐
Unhelpful ___:___:___:___:___ Helpful ☐

11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision. ☐

Interesting ___:___:___:___:___ Boring ☐
Unimportant ___:___:___:___:___ Important ☐
Slow ___:___:___:___:___ Fast ☐
Pleasant ___:___:___:___:___ Unpleasant ☐
Strong ___:___:___:___:___ Weak ☐
Helpful ___:___:___:___:___ Unhelpful ☐

12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic which are not explained fully in the book. ☐

Boring ___:___:___:___:___ Interesting ☐
Important ___:___:___:___:___ Unimportant ☐
Fast ___:___:___:___:___ Slow ☐
Pleasant ___:___:___:___:___ Unpleasant ☐
Weak ___:___:___:___:___ Strong ☐
Unhelpful ___:___:___:___:___ Helpful ☐

13. You play a geographical game which shows you some of the problems other people face in their lives or the effect luck has on them. ☐

Boring ___:___:___:___:___ Interesting ☐
Unimportant ___:___:___:___:___ Important ☐
Fast ___:___:___:___:___ Slow ☐
Pleasant ___:___:___:___:___ Unpleasant ☐
Weak ___:___:___:___:___ Strong ☐
Helpful ___:___:___:___:___ Unhelpful ☐

14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied. ☐

Interesting ___:___:___:___:___ Boring ☐
Unimportant ___:___:___:___:___ Important ☐
Slow ___:___:___:___:___ Fast ☐
Unpleasant ___:___:___:___:___ Pleasant ☐
Weak ___:___:___:___:___ Strong ☐
Helpful ___:___:___:___:___ Unhelpful ☐

Book Three

Written description	1	2	3	4	5	☐
Photographs	1	2	3	4	5	☐
Maps	1	2	3	4	5	☐
Diagrams	1	2	3	4	5	☐
Graphs	1	2	3	4	5	☐
Tables of figures	1	2	3	4	5	☐

Section Two.

INSTRUCTION:

In your geography lessons you will have used these books and will have looked at some or all of these ways of giving you information with your teacher or alone. You will have used them to answer questions, or have written about them or you will have copied some of them.

Please say how much you have used each of the ways of giving you information during this year.

Do this in the same way as for the last question, by drawing a circle around one of the numbers. The meaning of the numbers is:

1 = very often 2 = quite often 3 = occasionally
4 = not very often 5 = never

Written description	1	2	3	4	5	☐
Photographs	1	2	3	4	5	☐
Maps	1	2	3	4	5	☐
Diagrams	1	2	3	4	5	☐
Graphs	1	2	3	4	5	☐
Tables of figures	1	2	3	4	5	☐

Section Three.

INSTRUCTION:

These questions are about what *you* think about the ways of giving you information which are used in your geography books.

Under each way of giving information are six pairs of words which have opposite meanings. Between each pair of words are five spaces. The spaces let you say how strongly you feel that one or other of the words at each end of the line describes your feelings about the ways of giving you information.

Please put a tick on each line to show how strongly you feel that each word describes your feelings about the different ways of giving you information.

Here are some examples: If you are asked about "Filmstrips" -

Useful _/_:___:___:___:___ Useless means "I think filmstrips are very useful".

Useful ___:___:___:___:_/_ Useless means "I think filmstrips are completely useless".

Useful ___:_/_:___:___:___ Useless means "I think filmstrips are *quite* useful".

Useful ___:___:___:_/_:___ Useless means "I think filmstrips are fairly useless".

Useful ___:___:_/_:___:___ Useless means "I do not think they are useful or useless".

Remember: Look carefully at the words at both ends of the line before choosing - they are not always in the same order! Put one tick only on each line - six ticks for each way of giving information!

Written description

Interesting	___:___:___:___:___	Boring	☐
Unimportant	___:___:___:___:___	Important	☐ •
Fast	___:___:___:___:___	Slow	☐
Unpleasant	___:___:___:___:___	Pleasant	☐ •
Weak	___:___:___:___:___	Strong	☐ •
Helpful	___:___:___:___:___	Unhelpful	☐

Photographs

Boring	___:___:___:___:___	Interesting	☐ •
Unimportant	___:___:___:___:___	Important	☐ •
Fast	___:___:___:___:___	Slow	☐
Pleasant	___:___:___:___:___	Unpleasant	☐
Strong	___:___:___:___:___	Weak	☐
Helpful	___:___:___:___:___	Unhelpful	☐

5.

Maps

Boring	____:____:____:____:____	Interesting	☐	*
Important	____:____:____:____:____	Unimportant	☐	
Fast	____:____:____:____:____	Slow	☐	
Pleasant	____:____:____:____:____	Unpleasant	☐	
Weak	____:____:____:____:____	Strong	☐	*
Unhelpful	____:____:____:____:____	Helpful	☐	*

Diagrams

Interesting	____:____:____:____:____	Boring	☐	
Unimportant	____:____:____:____:____	Important	☐	*
Slow	____:____:____:____:____	Fast	☐	*
Unpleasant	____:____:____:____:____	Pleasant	☐	*
Weak	____:____:____:____:____	Strong	☐	*
Helpful	____:____:____:____:____	Unhelpful	☐	

Graphs

Boring	____:____:____:____:____	Interesting	☐	*
Important	____:____:____:____:____	Unimportant	☐	
Slow	____:____:____:____:____	Fast	☐	*
Pleasant	____:____:____:____:____	Unpleasant	☐	
Strong	____:____:____:____:____	Weak	☐	
Helpful	____:____:____:____:____	Unhelpful	☐	

Tables of figures

Boring	____:____:____:____:____	Interesting	☐	*
Unimportant	____:____:____:____:____	Important	☐	*
Fast	____:____:____:____:____	Slow	☐	
Pleasant	____:____:____:____:____	Unpleasant	☐	
Strong	____:____:____:____:____	Weak	☐	
Unhelpful	____:____:____:____:____	Helpful	☐	*

6.

Section Four.

INSTRUCTIONS:

The next questions ask what you think about the different ways in which you may have been asked to use the books in class or at home.

Please use the lines and words as you did in the previous questions.

If your lessons have never included activities like those described, please put a cross ('X') in the box on the right of the description and go straight on to the next description.

1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them. ☐

Boring	____:____:____:____:____	Interesting	☐	*
Important	____:____:____:____:____	Unimportant	☐	
Fast	____:____:____:____:____	Slow	☐	
Unpleasant	____:____:____:____:____	Pleasant	☐	*
Strong	____:____:____:____:____	Weak	☐	
Helpful	____:____:____:____:____	Unhelpful	☐	

2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to. ☐

Boring	____:____:____:____:____	Interesting	☐	*
Unimportant	____:____:____:____:____	Important	☐	*
Slow	____:____:____:____:____	Fast	☐	* ←Card 2.
Pleasant	____:____:____:____:____	Unpleasant	☐	
Strong	____:____:____:____:____	Weak	☐	
Unhelpful	____:____:____:____:____	Helpful	☐	*

3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own. ☐

Interesting	____:____:____:____:____	Boring	☐	
Unimportant	____:____:____:____:____	Important	☐	*
Slow	____:____:____:____:____	Fast	☐	*
Unpleasant	____:____:____:____:____	Pleasant	☐	*
Strong	____:____:____:____:____	Weak	☐	
Unhelpful	____:____:____:____:____	Helpful	☐	*

4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy. ☐

Interesting	____:____:____:____:____	Boring	☐	
Unimportant	____:____:____:____:____	Important	☐	*
Fast	____:____:____:____:____	Slow	☐	
Pleasant	____:____:____:____:____	Unpleasant	☐	
Strong	____:____:____:____:____	Weak	☐	
Unhelpful	____:____:____:____:____	Helpful	☐	*

SOME NOTES FOR THE ADMINISTRATION OF THE PUPIL QUESTIONNAIRE ON GEOGRAPHY BOOKS

Although the questionnaire has been pilot tested on first year pupils of average and below average ability and the instructions have been simplified accordingly, it would appear that many children still express doubts as to what is required of them. I should be most grateful, therefore, if you would talk your pupils through the sections one at a time - reading through the instructions with them and ensuring that they understand what to do.

A trial run with first year pupils and a teacher approaching the questionnaire 'cold' has suggested that about 35 minutes are required for completion. (I should be interested to hear of any marked differences from this in other schools or with other classes.)

The succesful processing of the results of this questionnaire and their ultimate interpretation depends to a great extent on its administration in the classroom. Please follow the notes which follow closely in order that differences between classes and schools are minimized.

The notes which follow refer to the front cover and each section (there are four sections) separately.

Front cover

Identity No.: Leave these boxes blank. (The identity number refers to the punched cards only and only incidentally to individual pupils. All pupils are therefore anonymous!)

School/Class No.: Please instruct pupils to complete these three boxes as follows:

Your .... class should enter ....

Your .... class should enter ....

Your .... class should enter ....

Teacher No.: Please ask all your pupils to enter ....

Year of school: This refers to the year of secondary education.

Your .... class should enter ....

Your .... class should enter ....

Your .... class should enter ....

Sex of pupil: Boy = 1; Girl = 2.

For the rest of the Questionnaire each section is preceded by 'Instructions' printed in boxes. These instructions may be explained to pupils in any way you feel will be most helpful and appropriate. However, please beware of giving any example which may suggest an appropriate response when the pupils give their own answers. Further, please do not give any help whatever with the interpretation of the problems presented to pupils.

Section One: This section is designed to test pupils' instant reaction and expectation on being presented with various books.

Please have available ONE copy of each of the three text books you have used most frequently with the class. If you have concentrated on one, or two, books only, with only infrequent use of a second (or third), then please omit "Book Three" or "Book Two". Please make the decision on whether to present one, two or three books to the class on whether they are likely to have some expectation of the book if given a copy at the start of a lesson.

Having read through the instructions with the pupils, hold up the most frequently used book for the class to see, reminding them of the title/author/ topic of the book (however you would usually refer to it in class). You may flip through the pages to aid recognition if this will help. However, please do not refer to the modes of presentation used in the book - e.g. you may say "this is the book we used when we studied ports" but not "this is the book from which you copied the map of Antwerp".

Pupils should then be asked to ring the appropriate numbers in their booklets. They will ring six numbers in all. Please remind them not to write anything in the boxes on the right.

A second book may then be held up and the procedure repeated, followed, if appropriate by a third.

Should any pupil seek further guidance, they may be told that line drawings should be considered as diagrams; pie and bar charts as graphs.

Please complete the following explanation and return it to me with the booklets:

- -

SCHOOL .... TEACHER ....

For class ...., BOOK ONE refers to ....
BOOK TWO refers to ....
BOOK THREE refers to ....

For class ...., BOOK ONE refers to ....
BOOK TWO refers to ....
BOOK THREE refers to ....

For class ...., BOOK ONE refers to ....
BOOK TWO refers to ....
BOOK THREE refers to ....

Section Two: This question is designed to investigate the pupils' perception of the amount of use made of the six modes of presentation used in most books. It is assumed that all six will occur in at least one of the books you have used with each class.

Should one or more occur in none of the books used by this class the class may be instructed to insert a number '9' in the box to the right of the page opposite the 'missing' mode. However, please do not point out this option to pupils unless you too are fairly certain that, for example, the class has not come across a single graph in any of the text books seen this year! In most cases pupils who 'cannot remember seeing one of those' should merely be reminded of the instructions for 'rarely used'.

Section Three: These questions are designed to investigate pupils' opinions of the various modes of presentation.

The instructions here may at first seem complex. Please read them through with the class. If another example is needed to clarify what is required, may I suggest the following:

> "The Instructions for this section" could be judged on the scale
>
> Difficult ____:____:____:____:____ Easy
>
> Most classes will have pupils who would wish to use all the various possible responses!

Please remind pupils that there are six pairs of words to be applied to each of the six modes of presentation.

Please do not help pupils with the meanings of the pairs of words. This is most important. Most of the words are self-evident to all pupils, but some pupils will have difficulty thinking of, e.g. written description as Fast....Slow or Weak ..... Strong. If a pupils queries these, or other, words, he/she should be told that their meaning to him/her is what matters and that he/she should try to choose a point somewhere on the line to express his/her point of view. (please do not explain further unless you are pressed hard, but if absolutely necessary a pupil may be told that if he/she would not use either word, the midpoint of the line would show that!)

Finally, please remind pupils that the words are not always in the same order and that they should read the words at both ends of the line before making their choice. If a pupils wants to change an answer, the tick may be crossed out and another inserted. However, pupils should be discouraged from pondering too long on each scale. First impulse answers are preferable.

Section Four: These questions test pupils' opinion of various teaching/lesson styles. It is probable that some pupils will never have experienced certain styles of geography lessons and in this case a cross (X) should be placed in the box with the double line around it on the right of the description. (All other boxed should be left blank)

The rest of the instructions are as for the previous section.

Pupils may then be left to complete their responses to all 14 lesson style descriptions.

I am very grateful to you and your pupils for taking the trouble to get this far!

Past experience has shown that most pupils are fascinated to know why such surveys are done and what the 'results' are. I would like to think - I most sincerely hope! - that this survey will reveal some areas in which text books could be more closely geared to teacher and pupil needs. The answer to enquiring pupils may, therefore, be most simply expressed in terms of 'market research'.

The views recorded by individual classes, as well as those of pupils of the same age across the whole sample, will be summarized and I will make this information available to you when we meet to discuss the results of the research as a whole. Perhaps this may be passed on to the classes who have helped during the autumn term if you think it appropriate.

Finally, may I repeat my thanks for all the work you have done on my behalf. When I have put the vast amount of information you have supplied to me into some digestible form, I will contact you to tell you the results.

READABILITY TEST OF YOUR GEOGRAPHY TEXT BOOK

This is a test of how difficult you and your class find your geography text books are to read and understand.

After a short introduction, each passage from the book has been typed with every seventh word missed out.

Please write in the exact word which you think the writer used in the book.

Spelling mistakes will not be marked wrong, but the word must be easy to recognize.

You may read back over the passages several times to work out which word should go in each gap.

Every gap is the same length so where the missing word is "a" or "the " the gap is just the same length as where a longer word like "sedimentary" has been missed out.

Do not leave any blanks.

Here is an example: Mary had a little lamb, its .... was white as snow, and everywhere .... Mary went the lamb was sure .... go.

The words missing are fleece, that and go! If you got that right, read on ...

CLOZE TEST ON 'FUEL AND POWER' by TONY CRISP

The graph shows you how much energy is needed by different users in the United Kingdom. A therm is a measurement of .... in the form of heat. Coal .... oil are even more important fuels .... you can tell from the graph. .... is because much electricity is made .... them.

As you have seen, coal .... a very important kind of fuel. .... Britain had not had great amounts .... coal it would be a far .... place. It would have less industry .... be poorer.

These three maps show .... of the ways in which coal .... changed Britain. The first one shows .... good farm lands. In 1700 most .... lived on these lands. The second .... shows where most people live today, ... the third map shows the areas .... coal is mined.

Coal was formed millions of years ago. At that time some large areas .... the world, including some parts of Britain, ... covered by swampy forests like this ....

Year by year in the warm .... forest the older trees and plants .... and new ones took their place. .... dead trees and plants rotted on .... bed of the swamp. Over many .... this rotting material formed a thick ....

Then floods washed over the layer .... rotting vegetation and covered it with .... and sand. Gradually the mud and .... became solid rocks and the rotting .... became coal.

Petroleum, like coal, is an immensely important fuel. It is used to drive many .... of transport, to power machinery and .... make electricity.

Its name means rock .... It is found in rocks that .... formed millions of years ago on .... beds of seas.

The dead bodies .... tiny creatures and plants like these .... in layers on the sea beds. .... were mixed with and covered by .... and other materials poured into the .... by rivers.

Gradually the dead creatures .... plants rotted to form oil. The .... and other materials became hard rocks.

.... some places the drops of oil .... together in traps.

Many places in Britain now use .... gas in cookers and fires. Natural .... is a kind of petroleum. There .... was some above the liquid petroleum in .... oil trap you studied.

As you .... see from the diagram, natural gas .... been found in rocks underneath the North Sea.

(There are 50 missing words)

APPENDIX G.

GENERAL SCHEDULE FOR TEACHER INTERVIEWS

1. When this syllabus was planned, was it planned around existing text books, or were new text books and other resources bought at that time? How much freedom do you have in chosing teaching resources for the classes you teach?

   In your opinion, is the course well resourced? If there is a mismatch between the syllabus and available resources within the school, how do you rationalize the situation?

2. Your pupils feel that they use the various methods of giving information in their text books like this ... (examine trends in results of Sect. Two of Pupil Questionnaire).
   Is this an accurate reflection of your use of the various books with them?
   Are the differences between the various classes you teach significant?
   Can these differences be attributed to text book differences?
   the age of the pupils?
   the behaviour of the class?
   the syllabus?
   the ability of the pupils?

3. Let us begin with the written text of the books.

   i) When you ask pupils to read (either with you or alone) do you find that they have difficulty in understanding? How do you overcome this?

   ii) Please rate your reasons for asking pupils to read alone on the list on Chart 1.

   iii) In the diary of your lessons, you asked pupils to read alone
   , and usually only after going over the passage with them.
   Please explain your reasons for this.
   What importance do you place on pupils reading by themselves in geography lessons?
   Would you ask pupils to read alone more if the language level of the text were easier?

4. Photographs

   i)Your pupils say that they use photographs in geography work
   Does this fairly represent your own attitude to their use in geography?

   ii)Please rate the sources of pictures you use in the classroom on Chart 2.

   iii)Please rate the possible reasons you may have for using photographs in geography lessons on Chart 3.

   iv)How much importance do you place on pictures in teaching your classes?
   Does this vary with different classes - due to age?
   ability?
   syllabus?
   behaviour?
   availability?

v) Please rate the possible ways of using photographs in geography lessons on Chart 4.

vi) Do you think that the photographs in this book are well chosen to assist with the topics?

Are the photographs used by the author to assist with his account or is their relevance to the topic left to the reader/teacher to elicit?

Does the author refer to the photographs in the questions/exercises he suggests? Do you find these suggested methods of using the photographs are adequate? Please explain any shortcomings you feel.

5. Maps

i) Your pupils say that they use maps in geography work ....
Does this fairly represent your own attitude to their use in geography?

ii) Please rate the possible reasons you may have for using maps in geography lessons on Chart 5.

iii) In your lesson diary, you listed atlas or O.S. maps only .... times. Is this representative of your lessons with this age group?

iv) How important do you regard maps in the course you offer this class? Does this vary with different classes? (see above)

v) How far do you find that the maps in the text book(s) you use are sufficient? How could they be improved?

vi) How far do you think that the maps in the book are an essential part of the information given or exercises/questions suggested by the author?

6. Diagrams

For the purposes of this study I am defining diagrams as graphics other than photographs which are not primarily concerned with the representation of numerical values.

i) The books you use with class ..... have many few diagrams such as these on pages ..... or ..... Your pupils consider that they are used .... in geography lessons. Is this a fair representation of your use of diagrams?

ii) Please rate the possible reasons for using diagrams on Chart 6.

iii) Chart 7. classifies the various types of diagrams usually found in textbooks. Please indicate which diagram types you find most useful with this class and which you would avoid using or foresee difficulties with. Is this difficulty due to - inappropriateness of type to syllabus?
- ability of pupils?
- age of pupils?
-

iv) In which ways do you find diagrams most helpful in your teaching?

v) Are the diagrams in the books the kind you might sketch on the blackboard yourself to clarify a point or do you still find your own diagrams are needed?

7. Graphs and Tables of figures

i) Does the response of your pupils to the frequency of use of graphs and tables in geography lessons fairly represent your attitude to these sources of information?

ii) Are the differences recorded between the responses of the classes under study due to - age of pupils?
- ability of pupils?
- syllabus?
- behaviour?
availability of appropriate statistics?

iii) Please rate the possible reasons you may have for using statistics in your lessons on Chart 8.

iv) How much emphasis do you place on the importance of statistics in your geography teaching?

v) Are the statistics well intergrated into the text or is their interpretation left to the reader/teacher?

vi) Do you find the author's suggested activities or questions based on statistical data useful?

8. The Pupil Questionnaire asked the pupils to respond to these various modes of giving them information on three scales: firstly to evaluate the mode, i.e. to judge the extent to which they see it as 'worthwhile'; secondly, to judge it on the grounds of whether they see it as being an'active' mode of giving information; and thirdly, to judge it on its strength or 'potency'.

Here are the responses of your class(es) compared with those of all 784 pupils of all ages and abilities, of both sexes, and with other pupils of their age.

i)Can you suggest any reasons for their choices?

ii)Can you suggest any reasons why they should vary from other pupils?

9. Here are fourteen teaching strategies which may involve the use of text books (on cards).

i)Please remove those you have never, or only very rarely, used.

ii)Place the rest of the cards in the order in which you regard them most useful for your classes.

iii)What differences would you make for your other class(es) in this study? Why?

10. May we look at the responses of your class(es) to these teaching strategies?
i)Please comment on them in the light of the pupils concerned and the text books available.

ii)Are there any teaching strategies - particularly where text books are involved - which I should have included?

11. i) In the lessons for which you kept a diary for me, you used questions or activities suggested by the author in ..... lessons. It seems to me that you generally chose questions of .... type and often avoided questions of ..... type. Is there a reason for this?

ii) How useful do you find the author's suggestions for activities or questions?

iii) What kind of activities or work suggestions do you think can most usefully be included in a text book for ...... age group?

12. Can you summarize your views on what constitutes a good textbook for this age group (these age groups)?

How should the type of text book change as pupils become older?

Some books are written with the intention of supplying all the resources and suggesting almost all the activities in geography for a given age group for a year. Is this an attainable ideal?
If you could find a book which approximated to your ideal course for a year, would you adopt such a single text book approach?

Where do you stand on the continuum of teachers who range in views from those who believe that the teacher should be the source of all knowledge and be in complete command of each learning experience and those who see themselves as presenting pupils with data and suggested activities based on that data and then helping individual pupils to learn at their own rate?

How much time do you spend in the preparation of teaching/learning materials or in hunting them down in a variety of places?

How could the resources available for the pupils following the geography courses being studied here be improved?

CHART 1.

Reasons for asking pupils to read from a text book

		Very often	Often	Sometimes	Seldom	Very rarely
a)	You want all the pupils to acquire some knowledge on which you can call and develop later in the lesson.					
b)	You want your pupils to revise some knowledge which you have explained to them to consolidate the lesson.					
c)	You want to allow your pupils to acquire some knowledge at their own individual speeds.					
d)	You want your pupils to select exercises or questions embodied in the text in the hope that this will arouse their interest in the topic.					
e)	You consider that the book covers the topic in a more interesting or informative way than you would have done.					
f)	You use the text book for social control purposes to assist in the discipline of the class.					
g)	You are interested in the pupils' perceptions of what are the most important geographical elements in the passage and intend to investigate and discuss these perceptions later.					
h)	The text contains examples of poetic or emotional writing which may inspire an emotional reaction in your pupils.					
i)	The text contains examples of particularly good writing styles which you hope your pupils will adopt.					
j)	It provides an opportunity for those who have finished the set work before the rest of the class to learn a little more about the topic.					

k) Other .....

CHART 2.

Sources of photographs used in geography teaching

a)	Packs of published photographs					
b)	Commercially produced colour slides or filmstrips					
c)	Colour slides taken by yourself or friends					
d)	Books of geography pictures					
e)	Text book pictures					
f)	Photographs taken ad hoc from other published sources e.g. magazines.					

CHART 3.

Reasons for introducing photographs into geography lessons

	Very often	Often	Sometimes	Seldom	V rarely
a) You want to arouse the interest of your pupils or motivate pupils to take an interest in the topic.	☐	☐	☐	☐	☐
b) You want to give your pupils a mental picture of some feature with which they may not be familiar (e.g. a pyramidal peak, synclinal structure, eskimo clothing, terraced housing)	☐	☐	☐	☐	☐
c) You use the photograph as a visual aid or prompt to your own memory as you describe matters portrayed or suggested by the picture.	☐	☐	☐	☐	☐
d) You want to show your pupils relationships in a landscape, e.g. between land use and height as demonstrated by a photograph of a valley and the moorland edge or heights of buildings declining with distance from a town centre as seen in an aerial photograph.	☐	☐	☐	☐	☐
e) Other					

CHART 4.

Possible ways of using photographs in a geography lesson

a) You describe the contents of the photograph using a question and answer technique to draw the attention of your pupils to the points relevant to your topic.	☐	☐	☐	☐	☐
b) You refer them to the photograph with little comment letting the photograph give its own message.	☐	☐	☐	☐	☐
c) You set specific questions based on the photograph to be answered in writing.	☐	☐	☐	☐	☐
d) You set specific work based on the photograph to be completed by your pupils other than by written answers e.g. a sketch of the photograph, with or without outline given, to be annotated or completed.	☐	☐	☐	☐	☐
e) You discuss the photograph with your pupils and encourage them to bring out information given in the picture which appears to them to be of significance.	☐	☐	☐	☐	☐
f) Other					

CHART 5.

Reasons for introducing maps into geography lessons

		Very often	Often	Sometimes	Seldom	V.rarely
a)	You want to show pupils where specified places are on the map or demonstrate the distribution of some feature across the part of the earth's surface portrayed on the map.	☐	☐	☐	☐	☐
b)	You want to give your pupils practice in finding places or patterns on the map in order to encourage a mental image of location.	☐	☐	☐	☐	☐
c)	You want to give your pupils practice in extracting information from a map in order that they may answer oral or written questions on it.	☐	☐	☐	☐	☐
d)	You want your pupils to memorize the position of places and features on the map for examination purposes.	☐	☐	☐	☐	☐
e)	You want your pupils to use the maps in the book or atlas as a basis for their own sketch maps on which information given in the text book or your own explanation can be summarized.	☐	☐	☐	☐	☐
f)	You want your pupils to have something to copy as a summary of the lesson.	☐	☐	☐	☐	☐
g)	Other					

CHART 6.

Reasons for using diagrams in geography lessons

a)	You want to clarify something already explained verbally e.g. the various stages whereby milk goes from a cow to a doorstep.	☐	☐	☐	☐	☐
b)	You want to describe something difficult to explain verbally, e.g. the nature of a hanging valley.	☐	☐	☐	☐	☐
c)	For pupils to copy as a simple reminder of a feature described in class, e.g. land use changes up the side of a fjord.	☐	☐	☐	☐	☐
d)	You want to summarize a number of features not usually to be seen in a single photograph or which would be difficult for pupils to discern on a photograph, e.g. a H.E.P. station, or features of a glaciated lowland.	☐	☐	☐	☐	☐
e)	You want to draw your pupils' attention to the essence of a feature or landscape so that pupils will be the better able to recognize the features in the field or on a photograph.	☐	☐	☐	☐	☐
f)	Other					

CHART 7.

Classification of diagrams commonly found in geography text books

	Very often	Often	Sometimes	Seldom	V. rarely
a) The diagram shows the structure of something, e.g. a trawl net, an H.E.P. station, a cocoa pod.	☐	☐	☐	☐	☐
b) The diagram demonstrates a theoretical model, e.g. the land use zones of a city as suggested by Burgess or the various parts of a settlement hierarchy.	☐	☐	☐	☐	☐
c) The diagram shows a cross section of an area to show relief or geology, e.g. the North & South Downs and the Weald.	☐	☐	☐	☐	☐
d) The diagram summarizes the explanation for some physical phenomenon such the angle of the sun's rays at the equator and the arctic circle or the wind movements in a cyclone.	☐	☐	☐	☐	☐
e) The diagram is used in lieu of a photograph without giving any more information than a photograph would have done, nor markedly simplifying the feature, e.g. a shaduf or a tor.	☐	☐	☐	☐	☐
f) The diagram is used to show something in three dimensions which would not be obvious in a photograph, e.g. a block diagram.	☐	☐	☐	☐	☐
g) The diagram represents something which could be shewn in a photograph but in simplified form and with annotations added, e.g. the head of a glaciated valley, land uses on the side of a fjord.	☐	☐	☐	☐	☐
h) The diagram is a flow diagram showing the stages of a process, e.g. an industrial process such as the making of steel or an input-output model of a farm.	☐	☐	☐	☐	☐
i) Other					

CHART 8.

Reasons for using graphs and tables of figures in geography lessons

a) You want to show pupils visually or numerically relationships already described in the text to reinforce that relationship in their minds.	☐	☐	☐	☐	☐
b) You want to give your pupils access to raw data so that they may judge the accuracy of generalized statements made by the author in his written text.	☐	☐	☐	☐	☐
c) You want to give pupils practice in translating from the numerical mode to the graphical and vice versa.	☐	☐	☐	☐	☐
d) You want to give pupils practice in extracting information from graphs and tables in order to answer written or oral questions.	☐	☐	☐	☐	☐
e) You want your pupils to make their own generalizations.	☐	☐	☐	☐	☐
f) You want your pupils to copy a graph or table as a reminder of the relationships described in the lesson.	☐	☐	☐	☐	☐
g) Other					

APPENDIX L

READABILITY SCORES OF TEXT BOOKS

AUTHOR(S)	DATE	SERIES and TITLE	PUBLISHER	BK.NO.	SAMPLE:	1	2	3	4	5	6	Mean
AYERS, A.C., KING, D. et al.	1977	Outlook Geography: Homescapes	Oliver and Boyd	1	Flesch	12.89	13.61	14.31	14.00	13.16	21.17	14.86
					Fry	12	13	14	13	13	21	14
AYERS, A.C., KING, D. et al	1978	Outlook Geography: Worldscapes	Oliver and Boyd	2	Flesch	19.66	12.75	18.37	14.35	14.73	14.35	15.71
					Fry	19	13	17	14	14	14	15
BEDDIS, R.A	1969 1975	New Secondary Geographies: Asia and North America	University of London Press	3	Flesch	14.74	14.16	17.23	14.65	16.31	15.99	15.51
					Fry	14	14	16	14	15	15	15
BEDDIS, R.A	1967 1973	New Secondary Geographies: The Land & People of Britain	University of London Press	4	Flesch	12.88	14.04	12.92	13.68	15.37	15.14	14.00
					Fry	12	14	13	13	14	14	14
BUNNETT, R.B.	1965	Physical Geography in Diagrams	Longman	5	Flesch	13.13	14.57	14.9	18.72	12.84	18.32	15.41
					Fry	13	14	14	17	13	17	14
CLARE, R	1971	Macdonald Colour Units: Geography: Earthquakes, Volcanoes and Mountains	Macdonald Educational	6	Flesch	12.06	13.38	14.99	12.16	13.09	12.72	13.07
					Fry	11	14	14	11	12	12	12
CLARE, R.	1974	Macdonald Educational Colour Units: World Topics: The Third World	Macdonald Educational	7	Flesch	14.8	12.35	12.71	13.61	15.4	14.73	13.93
					Fry	14	11	12	12	15	14	13
CRISP, T.	1974	People and Places: Food and Farming	Nelson	8	Flesch	11.66	11.72	12.34	11.03	12.34	11.94	11.84
					Fry	11	11	11	11	12	11	11
CRISP, T.	1974	People and Places: Towns	Nelson	9	Flesch	12.44	11.96	11.49	12.52	11.12	12.69	12.04
					Fry	11	11	10	12	10	12	11
CRISP, T.	1975	People and Places: Fuel and Power	Nelson	10	Flesch	11.81	12.09	12.34	12.93	12.23	11.41	12.13
					Fry	11	11	11	12	11	9	11
CRISP, T.	1975	People and Places: Transport	Nelson	11	Flesch	12.15	13.70	11.47	13.14	14.39	12.10	12.82
					Fry	11	13	10	13	14	12	12
CRISP, T.	1975	People and Places: Industry	Nelson	12	Flesch	18.21	17.80	13.05	11.58	12.04	11.97	14.11
					Fry	17	17	12	11	11	11	12
CRISP, T.	1975	People and Places: Different Worlds	Nelson	13	Flesch	11.72	12.93	11.51	13.49	12.95	12.89	12.75
					Fry	11	13	8	12	12	12	12
DINKELE, G.	1975	Revised Colour Geographies: Our Common Market Neighbours	Longman	14	Flesch	20.24	23.25	17.01	21.31	17.57	21.87	20.21
					Fry	19	22+	16	21	16	21	20
DOBSON, F.R. & VIRGO, H.E.	1964	A New School Geography: The Elements of Geography	The English Universities Press	15	Flesch	13.28	12.70	17.03	17.66	20.58	15.20	16.08
					Fry	13	12	15	16	21	14	15
DOBSON, F.R. & VIRGO, H.E.	1965	A New School Geography: The British Isles	The English Universities Press	16	Flesch	20.48	14.66	16.92	15.62	19.37	19.09	17.69
					Fry	19	14	15	15	18	18	16
DOBSON, F.R. & VIRGO, H.E.	1969	A New School Geography: North West Europe	The English Universities Press	17	Flesch	17.98	12.56	18.11	13.86	20.62	16.27	16.57
					Fry	16	13	17	14	18	15	15
FAWCETT, R.	1975	World in Focus: Spotlight on World Problems	Macmillan Education	18	Flesch	12.81	12.11	17.90	16.53	13.89	13.00	14.37
					Fry	12	11	17	15	14	12	13
FULLAGER, A.P.& VIRGO, H.E.	1967 1975	Map Reading and Local Studies in Colour	Hodder and Stoughton	19	Flesch	21.00	17.72	16.95	14.00	20.65	19.20	18.25
					Fry	22+	15	16	13	20	19	17
GOODSON, J.B.	1968	The British Isles- A Colour Geography	Thomas Nelson	20	Flesch	14.47	14.95	15.14	18.79	15.54	17.68	16.09
					Fry	14	14	14	18	15	16	15

AUTHOR(S)	DATE	SERIES and TITLE	PUBLISHER	BK.NO.	SAMPLE:	1	2	3	4	5	6	Mean
					READABILITY SCORES OF TEXT BOOKS							
GREASLEY, B. et al.	1979	Basic Geography Book 3	Harrap	21	Flesch	13.43	12.58	17.43	14.16	15.12	17.17	14.98
					Fry	13	12	16	14	14	16	14
GRENYER, N. et al.	1975	Oxford Geography Project: 3 Contrasts in Development	Oxford University Press	22	Flesch	14.67	12.62	16.75	14.33	14.66	13.67	14.45
					Fry	14	12	15	14	14	13	14
HADLOW, L.	1952 1970	Fundamental Geography Book 3: Climate, Vegetation and Man	University of London Press	23	Flesch	15.41	17.51	20.17	19.88	16.96	14.25	17.36
					Fry	15	16	17	20	16	14	16
KIMPTON, L.	1981	Geography in a Changing World: 2 Understanding Developing Places	Hodder and Stoughton	24	Flesch	18.04	14.69	14.43	14.19	13.25	18.28	15.48
					Fry	17	14	14	14	13	17	14
KNIGHTS, M.J.	1970 1977	Nelsons Geography Studies 13 Farming in the British Isles	Nelson	25	Flesch	14.42	12.84	16.41	14.66	14.67	18.69	15.28
					Fry	14	12	15	14	14	17	14
LONG, M & ROBERSON, B.S.	1969	World Problems: a Topic Geography	The English Universities Press	26	Flesch	13.22	13.41	17.67	14.08	14.06	15.84	14.71
					Fry	13	13	16	13	13	15	14
MARCHINGTON, T.	1974	Macdonald Educational Colour Units: World Topics: Natural Disasters	Macdonald	27	Flesch	12.91	14.45	12.91	12.34	13.47	12.28	13.06
					Fry	12	13	12	11	13	12	12
MARCHINGTON, T.	1972	Macdonald Colour Units: Geography: Reading Maps	Macdonald	28	Flesch	12.82	13.11	14.01	11.58	11.81	13.66	12.83
					Fry	12	12	13	11	11	13	12
MARSDEN, W.E.	1969	Geography of the British Isles Series: North West England	Cambridge University Press	29	Flesch	12.39	17.57	16.99	11.91	16.10	13.14	14.69
					Fry	12	16	16	11	15	13	13
MILLER, F.M.	1933 1970	The Physical Basis of Geography	George Philip	30	Flesch	12.00	19.62	19.94	14.82	16.59	16.74	16.62
					Fry	12	18	18	14	15	15	15
MONEY, D.C.	1970	Basic Geography	University Tutorial Press	31	Flesch	17.21	18.27	18.60	20.42	22.42	15.13	18.67
					Fry	16	17	17	22+	18	14	17
MONEY, D.C.	1978	Knowing World Geography: Key Book: Introducing World Studies	Evans	32	Flesch	12.43	14.56	20.36	14.35	17.66	15.12	15.75
					Fry	12	14	22+	14	16	15	15
MORRIS, J.A.	1960 1964	British Isles	Nelson	33	Flesch	12.65	18.61	14.99	16.83	22.31	15.45	16.80
					Fry	12	18	14	16	19	15	15
MORRIS, R.W.	1965	Britain and World Problems: Book 4 Britain and Beyond	Blackie	34	Flesch	12.64	13.28	13.14	17.32	14.18	11.64	12.96
					Fry	12	12	12	16	13	11	13
PADGET, S.	1972	Macdonald Colour Units: Geography: South East England	Macdonald	35	Flesch	14.97	19.07	14.36	14.63	12.71	18.44	15.70
					Fry	14	18	14	14	12	18	15
PADGET, S.	1972	Macdonald Colour Units: Geography: London	Macdonald	36	Flesch	18.30	15.32	15.77	17.82	15.39	14.35	16.16
					Fry	17	14	15	16	15	14	15
PADGET, S.	1973	Macdonald Colour Units: Geography: Farming and Fishing in Britain	Macdonald	37	Flesch	15.92	15.28	12.94	16.52	12.46	14.46	14.60
					Fry	15	15	12	16	12	14	14
PHILLIPS, J. & PHILLIPS, H	1976	Longmans Revised Colour Geographies: Progress and Change in West Africa	Longman	38	Flesch	12.78	15.91	11.96	12.20	17.24	13.13	13.87
					Fry	12	15	11	11	16	13	13
POXON, E.M. & POXON, J.D.	1975	Visual Geographies Unit 5 Asia	Pergamon Press	39	Flesch	12.49	16.09	17.40	12.04	13.43	13.59	14.17
					Fry	12	15	16	12	12	13	13
PREECE, D.M. & WOOD, H.R.B.	1938 1974	Modern Geography Series The British Isles	University Tutorial Press	40	Flesch	19.67	20.00	14.58	19.19	18.01	20.57	18.67
					Fry	19	18	14	17	16	21	18

AUTHOR	DATE	SERIES and TITLE	PUBLISHER	BK.NO.	SAMPLE:	1	2	3	4	5	6	Mean
PRICE, B.P.	1973	Macdonald Colour Units: Geography: Water, Ice and Wind	Macdonald	41	Flesch	15.85	13.56	12.42	15.79	17.26	12.97	14.64
					Fry	15	13	12	15	16	12	13
RANDLE, T.W.	1971 1977	Geographical Studies in Western Europe	Oliver and Boyd	42	Flesch	16.38	17.86	17.62	16.12	13.68	17.60	16.54
					Fry	15	16	16	15	13	16	15
REDMORE, G.B.	1964 1980	The Life and Livelihood Geographies: Book 2: Under the Southern Cross	John Murray	43	Flesch	17.53	13.83	13.86	13.87	13.24	13.48	14.30
					Fry	16	14	14	13	13	13	14
RICE, W.F.	1973	Patterns in Geography: Book One	Longman	44	Flesch	12.01	13.74	12.27	13.59	10.79	11.58	12.33
					Fry	12	13	12	13	9	10	12
RICE, W.F.	1978	Patterns in Geography: Book Three	Longman	45	Flesch	12.60	12.10	12.40	12.97	22.64	20.42	15.52
					Fry	12	12	12	13	17	19	14
ROLFE, J. et al.	1974 1979	Oxford Geography Project: 2 European Patterns	Oxford University Press	46	Flesch	12.47	14.64	13.74	13.69	14.55	16.25	14.22
					Fry	12	14	14	14	14	15	14
RUSHBY, J.G. et al.	1967	Study Geography Stage 1	Longman	47	Flesch	14.61	16.05	13.16	13.83	13.84	13.07	14.10
					Fry	14	15	13	13	14	12	13
SAVORY, H.J.	1968	A Geography of Wales	Cambridge University Press	48	Flesch	14.57	17.77	14.69	14.59	14.21	13.33	14.86
					Fry	14	16	14	14	14	13	14
SAVORY, H.J.	1972	South East England	Cambridge University Press	49	Flesch	14.73	19.22	14.61	14.71	13.03	12.78	14.85
					Fry	14	18	14	14	13	12	14
SIMONS, M.	1963	Windows on Geography: Europe and the U.S.S.R.	Hulton Educational	50	Flesch	15.75	13.38	12.63	12.74	12.09	12.65	13.21
					Fry	15	13	12	12	12	12	12
TERRY, A.G.	1969	The Physical Landscape	McGraw Hill	51	Flesch	16.90	13.47	15.45	16.81	15.17	16.88	15.78
					Fry	15	13	14	15	14	15	14
TOLSON, A.R. & JOHNSTONE, M.E.	1970	A Geography of Britain	Oxford Geography Press	52	Flesch	13.36	13.17	12.68	12.35	12.16	13.90	12.94
					Fry	13	12	12	12	12	14	12
WHITE, J.T.	1975	World in Focus: Spotlight on Europe	Macmillan Education	53	Flesch	14.53	15.37	13.13	14.68	15.30	12.82	14.30
					Fry	14	14	12	14	14	12	13
WILSON, J.G.	1975	Certificate Geography Language of Maps	Schofield and Sims	54	Flesch	15.59	15.04	13.81	13.32	17.89	12.16	14.99
					Fry	15	14	13	12	16	11	14
WILSON, J.G.	1978	Certificate Geography: The British Isles	Schofield and Sims	55	Flesch	16.90	19.94	14.69	16.43	14.80	20.29	17.17
					Fry	16	22+	14	16	14	22+	16
YOUNG, E.W. LOWRY, J.H.	1968	A Course in World Geography: 4 The British Isles	Edward Arnold	56	Flesch	16.95	14.78	14.90	14.85	17.39	17.58	16.07
					Fry	16	14	14	14	16	16	15
YOUNG, E.W. LOWRY, J.H.	1966 1972	A Course in World Geography: 6 Europe and the Soviet Union	Edward Arnold	57	Flesch	17.58	16.38	19.30	18.78	18.86	22.62	19.19
					Fry	16	15	19	18	17	21	18

BOOK NO: 1 SHORT TITLE: AYERS et al.; HOMESCAPES (126 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
18	245	130	53	1.73	77	17	83

Non-Experiential questions (N = 13):
Rhetorical: 0%; Confirming: 0%; Integrating: 69%; Open Ended: 31%;Valuing: 0%

Experiential questions (N = 64):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	2	0	0	0	2
Communicating	11	0	2	2	14
Comparing	10	14	0	0	25
Organizing	16	0	2	0	17
Experimenting	6	0	0	0	6
Inferring	19	17	0	0	36
Applying	0	0	0	0	0
TOTAL %	64	31	4	2	100

References to resources in experiential questions/activities
atlas 5%;realia 14%;photo 30%;map 20%;diagram 11%;graph 6%;table 14%;other 0%;
Proportions of total print area
text: 43%; photo: 25%; map: 19%; diagram: 8%; graph: 1%; table: 4%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	29	28	7	66	100
Maps	6	17	33	50	100
Diagrams	5	60	20	20	100
Graphs	2	100	0	0	100
Tables	6	67	0	33	100
ALL ILLUSTRATIONS	48	38	10	52	100

BOOK NO: 2 SHORT TITLE: AYERS et al.; WORLDSCAPES (132 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
18	336	127	38	1.63	85	36	64

Non-Experiential questions (N = 31):
Rhetorical: 0%; Confirming: 26%; Integrating: 61%; Open Ended: 10%;Valuing: 3%

Experiential questions (N = 54):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	2	0	0	0	2
Communicating	17	6	2	0	24
Comparing	13	9	2	0	24
Organizing	15	0	0	0	15
Experimenting	2	0	0	0	2
Inferring	15	15	4	0	33
Applying	0	0	0	0	0
TOTAL %	63	30	7	0	100

References to resources in experiential questions/activities
atlas 13%;realia 8%;photo 38%;map 10%;diagram 8%;graph13%;table 10%;other 0%;
Proportions of total print area
text: 52%; photo: 24%; map: 10%; diagram: 8%; graph: 3%; table: 3%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	19	21	11	68	79
Maps	8	13	0	88	25
Diagrams	9	44	11	44	67
Graphs	5	20	0	80	60
Tables	5	40	0	60	100
ALL ILLUSTRATIONS	46	26	7	67	67

BOOK NO: 3 SHORT TITLE: BEDDIS; ASIA & N. AMERICA (183 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
30	467	143	31	1.49	100	56	44

Non-Experiential questions (N = 56):
Rhetorical: 0%; Confirming: 27%; Integrating: 52%; Open Ended: 21%;Valuing: 0%

Experiential questions (N = 44):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	30	20	0	0	50
Comparing	5	14	0	0	19
Organizing	23	2	0	0	25
Experimenting	0	0	0	0	0
Inferring	0	5	2	0	7
Applying	0	0	0	0	0
TOTAL %	57	41	2	0	100

References to resources in experiential questions/activities (N = 44)
atlas 2%;realia 0%;photo 61%;map 19%;diagram 7%;graph 2%;table 9%;other 0%;

Proportions of total print area
text: 62%; photo: 23%; map: 9%; diagram: 3%; graph: 2%; table: 2%

Position of questions
initiatory: 6%; contextual: 36%; terminal: 52%; captional 5%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	22	64	36	0	55
Maps	6	83	0	17	67
Diagrams	4	75	25	0	100
Graphs	2	50	50	0	100
Tables	2	100	0	0	100
ALL ILLUSTRATIONS	36	69	28	3	67

BOOK NO: 4 SHORT TITLE: BEDDIS; BRITAIN (148 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
22	289	139	48	1.74	60	47	53

Non-Experiential questions (N = 28):

Rhetorical: 0%; Confirming: 29%; Integrating: 53%; Open Ended: 18%;Valuing: 0%

Experiential questions (N = 28):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	6	13	0	0	19
Communicating	6	6	0	0	12
Comparing	3	9	0	0	12
Organizing	26	19	3	0	48
Experimenting	0	0	0	0	0
Inferring	0	9	0	0	9
Applying	0	0	0	0	0
TOTAL %	41	56	3	0	100

References to resources in experiential questions/activities

atlas 0%;realia 3%;photo 42%;map 29%;diagram 16%;graph 3%;table 6%;other 0%;

Proportions of total print area

text: 54%; photo: 26%; map: 10%; diagram: 8%; graph: 1%; table: 1%

Position of questions

initiatory: 15%; contextual: 3%; terminal: 63%; captional: 20%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	9	11	56	33	44
Maps	4	0	100	0	75
Diagrams	7	0	57	43	57
Graphs	1	0	100	0	100
Tables	1	0	100	0	100
ALL ILLUSTRATIONS	22	5	68	27	59

BOOK NO: 6 SHORT TITLE: M.C.U. EARTHQUAKES (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	166	55	33	2.04	34	6	94

Non-Experiential questions (N = 2):

Rhetorical: 0%; Confirming: 0%; Integrating:100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 32):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	13	0	0	0	13
Comparing	13	3	0	0	16
Organizing	19	3	0	0	22
Experimenting	0	0	0	0	0
Inferring	28	22	0	0	50
Applying	0	0	0	0	0
TOTAL %	72	28	0	0	100

References to resources in experiential questions/activities

atlas 15%;realia 0%;photo 27%;map 19%;diagram 27%;graph 0%;table 0%;other 12%

Proportions of total print area

text: 39%; photo: 21%; map: 15%; diagram: 24%; graph: 0%; table: 0%

Position of questions

initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	9	22	56	22	44
Maps	4	25	50	25	100
Diagrams	8	25	13	63	63
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	21	24	38	38	62

BOOK NO: 7 SHORT TITLE: M.C.U. THIRD WORLD (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	171	30	18	1.88	23	61	39

Non-Experiential questions (N = 14):
Rhetorical: 0%; Confirming: 7%; Integrating: 64%; Open Ended: 14%;Valuing:14%

Experiential questions (N = 9):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	11	22	0	0	33
Comparing	0	0	0	0	0
Organizing	0	0	0	0	0
Experimenting	0	0	0	0	0
Inferring	11	44	11	0	67
Applying	0	0	0	0	0
TOTAL %	22	67	11	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 33%;map 33%;diagram 33%;graph 0%;table 0%;other 0%;
Proportions of total print area
text: 35%; photo: 35%; map: 15%; diagram: 14%; graph: 0%; table: 1%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	15	40	7	53	27
Maps	4	50	0	50	50
Diagrams	6	50	0	50	50
Graphs	0	0	0	0	0
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	26	46	4	50	38

BOOK NO: 8 SHORT TITLE: CRISP; FOOD AND FARMING (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	58	31	53	1.19	27	11	89

Non-Experiential questions (N = 3):
Rhetorical: 0%; Confirming: 0%; Integrating: 100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 24):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	4	0	0	0	4
Comparing	25	0	0	0	25
Organizing	25	0	0	0	25
Experimenting	0	0	0	0	0
Inferring	33	13	0	0	46
Applying	0	0	0	0	0
TOTAL %	88	13	0	0	100

References to resources in experiential questions/activities
atlas 10%;realia 0%;photo 20%;map 0%;diagram 40%;graph 10%;table 20%;other 0%;
Proportions of total print area
text: 19%; photo: 42%; map: 0%; diagram: 30%; graph: 6%; table: 3%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	43	57	0	29
Maps	0	0	0	0	0
Diagrams	5	0	60	40	100
Graphs	2	100	0	0	100
Tables	3	33	33	33	100
ALL ILLUSTRATIONS	17	35	47	18	59

BOOK NO: 9 SHORT TITLE: CRISP; TOWNS **(44 pages of text)**

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	60	47	78	1.68	35	11	89

Non-Experiential questions (N = 4):
Rhetorical: 0%; Confirming: 25%; Integrating: 50%; Open Ended: 25%;Valuing: 0%

Experiential questions (N = 31):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	3	0	0	0	3
Communicating	26	0	0	0	26
Comparing	23	16	0	0	39
Organizing	13	3	0	0	16
Experimenting	0	0	0	0	0
Inferring	10	3	3	0	16
Applying	0	0	0	0	0
TOTAL %	75	22	3	0	100

References to resources in experiential questions/activities
atlas 5%;realia27%;photo 16%;map 10%;diagram 16%;graph16%;table 10%;other 0%;
Proportions of total print area
text: 17%; photo: 26%; map: 11%; diagram: 30%; graph: 8%; table: 9%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	5	0	100	0	100
Maps	2	0	100	0	100
Diagrams	4	100	0	0	100
Graphs	2	0	100	0	100
Tables	2	100	0	0	100
ALL ILLUSTRATIONS	15	40	60	0	100

BOOK NO: 10 SHORT TITLE: CRISP; FUEL AND POWER (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	60	34	57	1.89	18	28	72

Non-Experiential questions (N = 5):

Rhetorical: 0%; Confirming: 20%; Integrating: 40%; Open Ended: 40%;Valuing: 0%

Experiential questions (N = 13):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	23	0	0	0	23
Comparing	8	8	0	0	15
Organizing	38	0	0	0	38
Experimenting	0	0	0	0	0
Inferring	8	15	0	0	23
Applying	0	0	0	0	0
TOTAL %	77	23	0	0	100

References to resources in experiential questions/activities

atlas 18%;realia 0%;photo 12%;map 29%;diagram 35%;graph 0%;table 6%;other 0%;

Proportions of total print area

text: 20%; photo: 12%; map: 45%; diagram: 22%; graph: 0%; table: 0%

Position of questions

initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	2	100	0	0	100
Maps	4	0	50	50	100
Diagrams	4	0	50	50	75
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	10	20	40	40	90

BOOK NO: 11 SHORT TITLE: CRISP; TRANSPORT (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	67	39	58	1.86	24	12	88

Non-Experiential questions (N = 3):
Rhetorical: 0%; Confirming: 0%; Integrating:100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 21):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	10	0	0	0	10
Comparing	19	5	0	0	24
Organizing	24	0	0	0	24
Experimenting	0	0	0	0	0
Inferring	29	10	5	0	43
Applying	0	0	0	0	0
TOTAL %	81	14	5	0	100

References to resources in experiential questions/activities
atlas 7%;realia 14%;photo 7%;map 0%;diagram 50%;graph 0%;table 7%;other 7%;
Proportions of total print area
text: 24%; photo: 32%; map: 0%; diagram: 31%; graph: 0%; table: 13%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	5	40	40	20	20
Maps	0	0	0	0	0
Diagrams	8	25	75	0	75
Graphs	0	0	0	0	0
Tables	2	50	50	0	100
ALL ILLUSTRATIONS	15	33	60	7	60

BOOK NO: 12 SHORT TITLE: CRISP; INDUSTRY (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	105	43	41	1.54	33	18	82

Non-Experiential questions (N = 6):
Rhetorical: 0%; Confirming: 33%; Integrating: 67%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 27):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	4	0	0	0	4
Communicating	26	4	0	0	30
Comparing	19	15	0	0	33
Organizing	4	0	0	0	4
Experimenting	0	0	0	0	0
Inferring	19	11	0	0	30
Applying	0	0	0	0	0
TOTAL %	70	30	0	0	100

References to resources in experiential questions/activities
atlas 16%;realia 4%;photo 20%;map 40%;diagram 12%;graph 8%;table 0%;other 0%;
Proportions of total print area
text: 32%; photo: 32%; map: 23%; diagram: 10%; graph: 3%; table: 0%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	71	0	29	43
Maps	6	50	50	0	100
Diagrams	2	0	50	50	100
Graphs	2	50	50	0	100
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	17	53	29	18	76

BOOK NO: 13 SHORT TITLE: CRISP; DIFFERENT WORLDS (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	83	39	47	1.5	28	29	71

Non-Experiential questions (N = 8):
Rhetorical: 0%; Confirming: 25%; Integrating: 38%; Open Ended: 0%;Valuing: 38%

Experiential questions (N = 20):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	15	0	0	0	15
Comparing	0	10	0	0	10
Organizing	20	0	5	0	25
Experimenting	0	0	0	0	0
Inferring	20	30	0	0	50
Applying	0	0	0	0	0
TOTAL %	55	40	5	0	100

References to resources in experiential questions/activities
atlas 5%;realia 11%;photo 32%;map 5%;diagram 32%;graph 0%;table 11%;other 5%
Proportions of total print area
text: 27%; photo: 24%; map: 10%; diagram: 37%; graph: 0%; table: 3%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	4	75	25	0	25
Maps	2	100	0	0	100
Diagrams	8	50	50	0	63
Graphs	0	0	0	0	0
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	15	67	33	0	60

BOOK NO: 14 SHORT TITLE: DINKELE;OUR COMMON MKT.NEIGHBOURS(45 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	130	42	32	1.56	35	31	69

Non-Experiential questions (N = 11):

Rhetorical: 27%: Confirming: 0%; Integrating: 36%; Open Ended: 36%;Valuing: 0%

Experiential questions (N = 24):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	8	4	0	4	16
Comparing	17	13	13	4	46
Organizing	17	8	0	0	25
Experimenting	0	0	0	0	0
Inferring	0	4	4	4	13
Applying	0	0	0	0	0
TOTAL %	42	29	17	12	100

References to resources in experiential questions/activities

atlas 13%;realia 0%;photo 13%;map 37%;diagram 0%;graph 0%;table 31%;other 6%

Proportions of total print area

text: 49%; photo: 15%; map: 12%; diagram: 0%; graph: 15%; table: 10%

Position of questions

initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	3	100	0	0	100
Maps	4	25	25	50	75
Diagrams	0	0	0	0	0
Graphs	1	100	0	0	0
Tables	2	50	0	50	100
ALL ILLUSTRATIONS	10	60	10	30	80

BOOK NO: 15 SHORT TITLE: DOBSON & VIRGO; ELEMENTS (160 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
24	361	56	16	2.67	40	42	58

Non-Experiential questions (N = 17):

Rhetorical: 0%; Confirming: 12%; Integrating: 64%; Open Ended: 24%;Valuing: 0%

Experiential questions (N = 23):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	13	4	4	0	22
Communicating	17	4	0	0	22
Comparing	0	0	0	0	0
Organizing	22	4	0	0	26
Experimenting	13	9	0	0	22
Inferring	0	9	0	0	9
Applying	0	0	0	0	0
TOTAL %	65	30	4	0	100

References to resources in experiential questions/activities

atlas 26%;realia 26%;photo 43%;map 0%;diagram 5%;graph 0%;table 0%;other 0%

Proportions of total print area

text: 57%; photo: 25%; map: 2%; diagram: 6%; graph: 8%; table: 2%

Position of questions

initiatory: 0%; contextual: 14%; terminal: 81%; captional 5%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	6	100	0	0	83
Maps	1	100	0	0	0
Diagrams	8	13	25	63	13
Graphs	4	50	0	50	0
Tables	1	100	0	0	0
ALL ILLUSTRATIONS	20	55	10	35	30

BOOK NO: 16 SHORT TITLE: DOBSON & VIRGO; BRITISH ISLES (147 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
22	232	37	16	1.48	27	11	89

Non-Experiential questions (N = 3):
Rhetorical: 0%; Confirming: 67%; Integrating: 33%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 24):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	4	17	0	0	21
Comparing	0	0	0	0	0
Organizing	25	4	0	0	29
Experimenting	0	0	0	0	0
Inferring	21	25	4	0	50
Applying	0	0	0	0	0
TOTAL %	50	46	4	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 38%;map 62%;diagram 0%;graph 0%;table 0%;other 0%

Proportions of total print area
text: 35%; photo: 43%; map: 21%; diagram: 1%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 64%; terminal: 16%; captional 20%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	12	100	0	0	92
Maps	10	90	0	10	60
Diagrams	1	100	0	0	0
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	23	96	0	4	74

BOOK NO: 17 SHORT TITLE: DOBSON & VIRGO; N.W.EUROPE (124 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
16	192	16	8	1.23	15	60	40

Non-Experiential questions (N = 9):
Rhetorical: 0%; Confirming: 0%; Integrating: 89%; Open Ended: 11%;Valuing: 0%

Experiential questions (N = 6):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	0	0	0	0
Comparing	0	17	0	0	17
Organizing	33	0	0	0	33
Experimenting	0	0	0	0	0
Inferring	0	50	0	0	50
Applying	0	0	0	0	0
TOTAL %	33	67	0	0	100

References to resources in experiential questions/activities
atlas 25%;realia 0%;photo 25%;map 25%;diagram 0%;graph 25%;table 0%;other 0%

Proportions of total print area
text: 35%; photo: 32%; map: 26%; diagram: 1%; graph: 4%; table: 2%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 23%; captional 77%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	18	27	55	18
Maps	7	14	14	71	14
Diagrams	3	0	0	100	0
Graphs	2	100	0	0	50
Tables	1	0	100	0	0
ALL ILLUSTRATIONS	24	21	21	58	17

BOOK NO: 18 SHORT TITLE: FAWCETT; SPOTLIGHT/WORLD PROBLEMS (63 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
12	341	135	40	1.82	90	51	49

Non-Experiential questions (N = 46):
Rhetorical: 37%; Confirming: 4%; Integrating: 52%; Open Ended: 7%;Valuing: 0%

Experiential questions (N = 44):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	7	0	0	0	7
Communicating	23	5	0	0	28
Comparing	20	9	0	0	29
Organizing	14	5	2	0	20
Experimenting	0	0	0	0	0
Inferring	0	9	5	2	16
Applying	0	0	0	0	0
TOTAL %	64	27	7	2	100

References to resources in experiential questions/activities
atlas 24%;realia 0%;photo 4%;map 60%;diagram 4%;graph 8%;table 0%;other 0%

Proportions of total print area
text: 43%; photo: 12%; map: 21%; diagram: 14%; graph: 8%; table: 2%

Position of questions
initiatory: 0%; contextual: 91%; terminal: 8%; captional 1%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	3	67	33	0	33
Maps	7	71	29	0	86
Diagrams	4	75	25	0	25
Graphs	3	100	0	0	100
Tables	2	50	50	0	100
ALL ILLUSTRATIONS	19	74	26	0	68

BOOK NO: 19 SHORT TITLE: FULLAGER & VIRGO; MAP READING (62 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	162	33	20	2.36	17	6	94

Non-Experiential questions (N = 1):
Rhetorical: 0%; Confirming: 0%; Integrating: 0%; Open Ended: 100%;Valuing: 0%

Experiential questions (N = 16):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	0	0	0	0
Comparing	0	25	0	0	25
Organizing	6	13	0	0	19
Experimenting	0	6	0	0	6
Inferring	13	25	0	0	38
Applying	6	6	0	0	12
TOTAL %	25	75	0	0	100

References to resources in experiential questions/activities
atlas 7%;realia 0%;photo 7%;map 72%;diagram 14%;graph 0%;table 0%;other 0%

Proportions of total print area
text: 39%; photo: 7%; map: 38%; diagram: 11%; graph: 0%; table: 4%

Position of questions
initiatory: 0%; contextual: 29%; terminal: 64%; captional 7%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	3	100	0	0	100
Maps	6	67	0	33	83
Diagrams	4	25	0	75	50
Graphs	0	0	0	0	0
Tables	3	0	0	100	100
ALL ILLUSTRATIONS	16	50	0	50	81

BOOK NO: 20 SHORT TITLE: GOODSON; BRITISH ISLES (120 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
16	178	7	4	1.4	5	80	20

Non-Experiential questions (N = 4):
Rhetorical: 0%; Confirming: 50%; Integrating: 25%; Open Ended: 25%;Valuing: 0%

Experiential questions (N = 1):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	0	0	0	0
Comparing	0	0	0	0	0
Organizing	0	0	0	0	0
Experimenting	0	0	0	0	0
Inferring	100	0	0	0	0
Applying	0	0	0	0	0
TOTAL %	100	0	0	0	0

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 0%;map 0%;diagram 0%;graph 100%;table 0%;other 0%
Proportions of total print area
text: 31%; photo: 42%; map: 21%; diagram: 5%; graph: 1%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 0%; captional 100%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	22	59	36	5	0
Maps	13	77	8	15	0
Diagrams	5	60	0	40	0
Graphs	2	100	0	0	50
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	42	67	21	12	2

BOOK NO: 21 SHORT TITLE: GREASLEY et al.; BASIC GEOGRAPHY 3 (60 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
10	157	71	45	2.22	37	16	84

Non-Experiential questions (N = 6):
Rhetorical: 0%; Confirming: 0%; Integrating: 67%; Open Ended: 33%;Valuing: 0%

Experiential questions (N = 31):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	16	3	3	0	23
Comparing	3	3	0	0	6
Organizing	23	6	0	0	29
Experimenting	0	0	3	0	3
Inferring	13	16	0	10	39
Applying	0	0	0	0	0
TOTAL %	55	29	6	9	100

References to resources in experiential questions/activities
atlas 0%;realia 32%;photo 9%;map 18%;diagram 5%;graph 23%;table 5%;other 0%

Proportions of total print area
text: 38%; photo: 16%; map: 17%; diagram: 22%; graph: 1%; table: 6%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	91	9	0	64
Maps	8	75	0	25	100
Diagrams	5	60	20	20	80
Graphs	2	50	50	0	100
Tables	4	50	50	0	50
ALL ILLUSTRATIONS	30	73	17	10	77

BOOK NO: 22 SHORT TITLE: GRENYER et al. O.G.P. 3 (148 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
22	247	102	41	3.29	53	30	70

Non-Experiential questions (N = 16):
Rhetorical: 0%; Confirming: 19%; Integrating: 50%; Open Ended: 31%;Valuing: 0%

Experiential questions (N = 37):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	3	3	0	0	6
Communicating	0	0	0	0	0
Comparing	11	14	5	0	30
Organizing	11	22	0	0	32
Experimenting	0	0	0	0	0
Inferring	3	14	0	0	16
Applying	11	5	0	0	16
TOTAL %	38	57	5	0	100

References to resources in experiential questions/activities
atlas 5%;realia 2%;photo 10%;map 48%;diagram 7%;graph 12%;table 17%;other 0%
Proportions of total print area
text: 39%; photo: 24%; map: 24%; diagram: 6%; graph: 1%; table: 7%

Position of questions
initiatory: 3%; contextual: 81%; terminal: 16%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	13	46	8	46	46
Maps	8	38	0	63	88
Diagrams	4	25	50	25	50
Graphs	1	0	0	100	100
Tables	7	43	43	14	100
ALL ILLUSTRATIONS	33	40	18	42	58

BOOK NO: 23 SHORT TITLE: HADLOW; FUNDAMENTAL GEOG. 3 (265 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
31	291	24	8	1	23	57	43

Non-Experiential questions (N = 13):
Rhetorical: 0%; Confirming: 0%; Integrating:100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 10):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	0	0	0	0
Comparing	0	0	0	0	0
Organizing	0	0	0	0	0
Experimenting	20	0	0	0	20
Inferring	30	50	0	0	80
Applying	0	0	0	0	0
TOTAL %	50	50	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 40%;photo 20%;map 0%;diagram 0%;graph 0%;table 40%;other 0%

Proportions of total print area
text: 66%; photo: 13%; map: 1%; diagram: 15%; graph: 0%; table: 5%

Position of questions
initiatory: 0%; contextual: 4%; terminal: 88%; captional 8%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	9	100	0	0	22
Maps	1	0	100	0	0
Diagrams	11	9	18	73	9
Graphs	0	0	0	0	0
Tables	7	43	14	43	29
ALL ILLUSTRATIONS	28	46	14	39	18

BOOK NO: 24 SHORT TITLE: KIMPTON; DEVELOPING PLACES (124 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
18	295	100	34	2.63	44	20	80

Non-Experiential questions (N = 9):
Rhetorical: 0%; Confirming: 11%; Integrating: 89%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 35):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	3	0	0	0	3
Comparing	20	23	0	0	43
Organizing	11	11	0	0	23
Experimenting	0	0	0	0	0
Inferring	3	20	0	0	23
Applying	9	0	0	0	9
TOTAL %	46	54	0	0	100

References to resources in experiential questions/activities
atlas 4%;realia 0%;photo 32%;map 16%;diagram 20%;graph 0%;table 28%;other 0%
Proportions of total print area
text: 54%; photo: 21%; map: 4%; diagram: 15%; graph: 0%; table: 6%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	28	25	21	54	75
Maps	2	0	0	100	50
Diagrams	9	0	22	78	67
Graphs	0	0	0	0	0
Tables	6	50	0	50	100
ALL ILLUSTRATIONS	45	22	18	60	76

BOOK NO: 25 SHORT TITLE: KNIGHTS; FARMING IN BRIT.IS. (43 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
6	113	56	50	1.65	54	39	61

Non-Experiential questions (N = 21):
Rhetorical: 0%; Confirming: 48%; Integrating: 52%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 33):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	15	0	0	0	15
Communicating	3	9	0	0	12
Comparing	21	9	0	0	30
Organizing	0	0	0	0	0
Experimenting	0	0	0	0	0
Inferring	27	15	0	0	42
Applying	0	0	0	0	0
TOTAL %	67	33	0	0	100

References to resources in experiential questions/activities
atlas33%;realia 0%;photo 33%;map 17%;diagram 6%;graph 0%;table 11%;other 0%
Proportions of total print area
text: 39%; photo: 45%; map: 10%; diagram: 2%; graph: 0%; table: 4%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	0	86	14	100
Maps	2	0	50	50	100
Diagrams	1	0	100	0	100
Graphs	0	0	0	0	0
Tables	2	0	50	50	100
ALL ILLUSTRATIONS	12	0	75	25	100

BOOK NO: 26 SHORT TITLE: LONG & ROBERSON; WORLD PROBLEMS (210 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
28	454	82	18	3.15	55	49	51

Non-Experiential questions (N = 27):

Rhetorical: 0%; Confirming: 22%; Integrating: 48%; Open Ended: 30%;Valuing: 0%

Experiential questions (N = 28):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	4	0	4	0	7
Communicating	21	4	0	0	25
Comparing	18	0	0	0	18
Organizing	29	11	0	0	39
Experimenting	0	0	0	0	0
Inferring	4	7	0	0	11
Applying	0	0	0	0	0
TOTAL %	75	21	4	0	100

References to resources in experiential questions/activities

atlas12%;realia 0%;photo 29%;map 29%;diagram 0%;graph 0%;table 29%;other 0%

Proportions of total print area

text: 49%; photo: 22%; map: 23%; diagram: 2%; graph: 1%; table: 3%

Position of questions

initiatory: 0%; contextual: 0%; terminal: 100%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	9	100	0	0	33
Maps	18	6	33	61	44
Diagrams	3	0	0	100	33
Graphs	1	0	100	0	0
Tables	6	83	0	17	83
ALL ILLUSTRATIONS	37	41	19	41	46

BOOK NO: 27 SHORT TITLE: M.C.U. NATURAL DISASTERS (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	204	13	6	1.08	12	83	17

Non-Experiential questions (N = 10):
Rhetorical: 0%; Confirming: 10%; Integrating: 80%; Open Ended: 10%;Valuing: 0%

Experiential questions (N = 2):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	0	0	0	0
Comparing	0	0	0	0	0
Organizing	0	0	0	0	0
Experimenting	0	0	0	0	0
Inferring	50	50	0	0	100
Applying	0	0	0	0	0
TOTAL %	50	50	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 50%;map 50%;diagram 0%;graph 0%;table 0%;other 0%
Proportions of total print area
text: 37%; photo: 36%; map: 17%; diagram: 4%; graph: 0%; table: 6%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	86	14	0	14
Maps	4	100	0	0	25
Diagrams	3	100	0	0	0
Graphs	0	0	0	0	0
Tables	3	100	0	0	0
ALL ILLUSTRATIONS	17	94	6	0	12

BOOK NO: 28 SHORT TITLE: M.C.U. READING MAPS (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	222	89	40	2.47	42	5	95

Non-Experiential questions (N = 2):

Rhetorical: 0%; Confirming: 0%; Integrating:100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 40):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	5	0	0	0	5
Comparing	25	0	0	0	25
Organizing	7	3	0	0	10
Experimenting	23	3	3	0	28
Inferring	5	17	0	0	22
Applying	10	0	0	0	10
TOTAL %	74	23	3	0	100

References to resources in experiential questions/activities

atlas 0%;realia 34%;photo 6%;map 47%;diagram 13%;graph 0%;table 0%;other 0%

Proportions of total print area

text: 50%; photo: 22%; map: 15%; diagram: 13%; graph: 0%; table: 0%

Position of questions

initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	86	0	14	29
Maps	3	0	33	67	67
Diagrams	6	0	0	100	83
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	16	38	6	56	56

BOOK NO: 29 SHORT TITLE: MARSDEN; N.W. ENGLAND (76 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
10	168	29	17	1.93	21	43	57

Non-Experiential questions (N = 9):
Rhetorical: 0%; Confirming: 11%; Integrating: 78%; Open Ended: 11%;Valuing: 0%

Experiential questions (N = 12):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	25	0	0	0	25
Comparing	8	0	0	0	8
Organizing	17	0	0	0	17
Experimenting	0	0	0	0	0
Inferring	17	25	0	0	42
Applying	8	0	0	0	8
TOTAL %	75	25	0	0	100

References to resources in experiential questions/activities
atlas 10%;realia 0%;photo 30%;map 50%;diagram 0%;graph 0%;table 0%;other 0%

Proportions of total print area
text: 49%; photo: 22%; map: 27%; diagram: 2%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	3	0	0	100	33
Maps	4	0	0	100	25
Diagrams	1	0	0	100	0
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	8	0	0	100	25

BOOK NO: 30   SHORT TITLE: MILLER: PHYS. BASIS OF GEOG.   (142 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
20	299	45	15	1.73	33	91	9

Non-Experiential questions (N = 30):
Rhetorical: 0%; Confirming: 20%; Integrating: 57%; Open Ended: 23%;Valuing: 0%

Experiential questions (N = 3):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	33	0	0	33
Comparing	0	0	0	0	0
Organizing	0	33	0	0	33
Experimenting	33	0	0	0	33
Inferring	0	0	0	0	0
Applying	0	0	0	0	0
TOTAL %	33	67	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 66%;photo 0%;map 0%;diagram 33%;graph 0%;table 0%;other 0%

Proportions of total print area
text: 80%; photo: 0%; map: 0%; diagram: 14%; graph: 0%; table: 6%

Position of questions
initiatory: 0%; contextual: 12%; terminal: 88%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	0	0	0	0	0
Maps	0	0	0	0	0
Diagrams	12	0	25	75	17
Graphs	0	0	0	0	0
Tables	6	0	100	0	0
ALL ILLUSTRATIONS	18	0	50	50	11

BOOK NO: 31 SHORT TITLE: MONEY; BASIC GEOGRAPHY (149 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
22	277	69	25	25	49	71	29

Non-Experiential questions (N = 35):
Rhetorical: 0%; Confirming: 0%; Integrating: 97%; Open Ended: 3%;Valuing: 0%

Experiential questions (N = 14):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	7	0	0	7
Comparing	14	7	0	0	21
Organizing	14	14	0	0	29
Experimenting	0	0	0	0	0
Inferring	0	43	0	0	43
Applying	0	0	0	0	0
TOTAL %	29	71	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 17%;map 25%;diagram 42%;graph 17%;table 0%;other 0%
Proportions of total print area
text: 51%; photo: 4%; map: 8%; diagram: 31%; graph: 3%; table: 3%

Position of questions
initiatory: 0%; contextual: 5%; terminal: 95%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	4	75	0	25	25
Maps	4	25	0	75	25
Diagrams	31	6	10	84	13
Graphs	4	0	25	75	0
Tables	1	0	0	100	0
ALL ILLUSTRATIONS	44	14	9	77	14

BOOK NO: 32 SHORT TITLE: MONEY; INTROD. WORLD STUDIES (44 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	206	66	32	2	41	37	63

Non-Experiential questions (N = 15):
Rhetorical: 0%; Confirming: 20%; Integrating: 73%; Open Ended: 7%;Valuing: 0%

Experiential questions (N = 26):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	23	0	0	4	27
Communicating	12	4	0	0	15
Comparing	19	4	0	0	23
Organizing	12	0	0	0	12
Experimenting	0	0	0	0	0
Inferring	8	15	0	0	23
Applying	0	0	0	0	0
TOTAL %	73	23	0	3	100

References to resources in experiential questions/activities
atlas 35%;realia 5%;photo 25%;map 10%;diagram 10%;graph 0%;table 0%;other 15%

Proportions of total print area
text: 58%; photo: 31%; map: 7%; diagram: 4%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	12	67	25	8	33
Maps	3	67	33	0	67
Diagrams	2	0	100	0	100
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	17	59	35	6	47

BOOK NO: 33 SHORT TITLE: MORRIS; BRITISH ISLES (274 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
38	420	31	7	1.94	19	63	37

Non-Experiential questions (N = 12):
Rhetorical: 0%; Confirming: 17%; Integrating: 75%; Open Ended: 8%;Valuing: 0%

Experiential questions (N = 7):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	29	0	0	0	29
Comparing	0	0	0	0	0
Organizing	42	0	0	0	42
Experimenting	0	0	0	0	0
Inferring	29	0	0	0	29
Applying	0	0	0	0	0
TOTAL %	100	0	0	0	100

References to resources in experiential questions/activities
atlas 33%;realia 16%;photo 16%;map 0%;diagram 0%;graph 0%;table 33%;other 0%

Proportions of total print area
text: 65%; photo: 15%; map: 13%; diagram: 2%; graph: 4%; table: 1%.

Position of questions
initiatory: 0%; contextual: 0%; terminal: 94%; captional 6%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	13	100	0	0	0
Maps	13	92	0	8	0
Diagrams	3	100	0	0	0
Graphs	7	100	0	0	0
Tables	2	100	0	0	100
ALL ILLUSTRATIONS	38	97	0	3	5

BOOK NO: 34 SHORT TITLE: MORRIS; BRITAIN & BEYOND (317 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
25	385	99	26	2.36	58	52	48

Non-Experiential questions (N = 30):
Rhetorical: 0%; Confirming: 37%; Integrating: 60%; Open Ended: 3%;Valuing: 0%

Experiential questions (N = 28):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	4	18	0	0	21
Comparing	21	11	0	0	32
Organizing	14	0	0	0	14
Experimenting	0	0	0	0	0
Inferring	14	14	0	4	32
Applying	0	0	0	0	0
TOTAL %	54	43	0	3	100

References to resources in experiential questions/activities
atlas 5%;realia 0%;photo 42%;map 21%;diagram 5%;graph 11%;table 16%;other 0%
Proportions of total print area
text: 69%; photo: 20%; map: 6%; diagram: 2%; graph: 3%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	15	0	27	73	67
Maps	2	0	0	100	50
Diagrams	1	0	0	100	100
Graphs	2	50	0	50	100
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	20	5	20	75	70

BOOK NO: 35 SHORT TITLE: M.C.U. S.E. ENGLAND (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
6	122	22	18	1.83	14	57	43

Non-Experiential questions (N = 8):
Rhetorical: 0%; Confirming: 38%; Integrating: 63%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 6):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	17	0	0	0	17
Comparing	0	0	0	0	0
Organizing	50	0	0	0	50
Experimenting	0	0	0	0	0
Inferring	17	0	17	0	33
Applying	0	0	0	0	0
TOTAL %	83	0	17	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 20%;map 40%;diagram 40%;graph 0%;table 0%;other 0%
Proportions of total print area
text: 42%; photo: 20%; map: 14%; diagram: 21%; graph: 0%; table: 3%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	7	86	0	14	14
Maps	3	100	0	0	67
Diagrams	5	80	0	20	20
Graphs	0	0	0	0	0
Tables	1	100	0	0	0
ALL ILLUSTRATIONS	16	88	0	12	25

BOOK NO: 36 SHORT TITLE: M.C.U. LONDON (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
6	92	23	25	1.77	14	21	79

Non-Experiential questions (N = 3):
Rhetorical: 0%; Confirming: 33%; Integrating: 0%; Open Ended: 67%;Valuing: 0%

Experiential questions (N = 11):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	9	0	0	0	9
Communicating	18	18	0	0	36
Comparing	0	0	0	0	0
Organizing	9	0	0	0	9
Experimenting	0	0	0	0	0
Inferring	18	27	0	0	45
Applying	0	0	0	0	0
TOTAL %	55	45	0	0	100

References to resources in experiential questions/activities
atlas 9%;realia 0%;photo 0%;map 45%;diagram 18%;graph 0%;table 27%;other 0%

Proportions of total print area
text: 26%; photo: 26%; map: 35%; diagram: 9%; graph: 0%; table: 4%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	12	100	0	0	0
Maps	5	80	20	0	60
Diagrams	2	100	0	0	100
Graphs	0	0	0	0	0
Tables	3	0	33	67	100
ALL ILLUSTRATIONS	22	82	9	9	36

BOOK NO: 37 SHORT TITLE: M.C.U. FARMING & FISHING (24 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	232	24	10	1.04	23	61	39

Non-Experiential questions (N = 14):
Rhetorical: 0%; Confirming: 14%; Integrating: 50%; Open Ended: 36%;Valuing: 0%

Experiential questions (N = 9):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	11	11	0	0	22
Comparing	11	0	0	0	11
Organizing	22	0	0	0	22
Experimenting	0	0	0	0	0
Inferring	11	33	0	0	44
Applying	0	0	0	0	0
TOTAL %	56	44	0	0	100

References to resources in experiential questions/activities
atlas 0%;other bk.0%;realia 0%;photo 22%;map 12%;diagram 22%;graph22%;table 22%

Proportions of total print area
text: 48%; photo: 35%; map: 1%; diagram: 8%; graph: 1%; table: 7%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	91	0	9	9
Maps	2	50	50	0	50
Diagrams	3	100	0	0	67
Graphs	1	100	0	0	100
Tables	4	50	50	0	50
ALL ILLUSTRATIONS	21	76	19	5	33

BOOK NO: 38 SHORT TITLE: PHILLIPS; WEST AFRICA (45 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	145	21	14	1.31	18	33	67

Non-Experiential questions (N = 6):
Rhetorical: 17%; Confirming: 17%; Integrating: 49%; Open Ended: 17%;Valuing: 0%

Experiential questions (N = 12):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	25	0	8	0	33
Comparing	8	0	0	0	8
Organizing	25	0	0	0	25
Experimenting	0	0	0	0	0
Inferring	33	0	0	0	33
Applying	0	0	0	0	0
TOTAL %	92	0	8	0	100

References to resources in experiential questions/activities
atlas 25%;realia 25%;photo 38%;map 12%;diagram 0%;graph 0%;table 0%;other 0%

Proportions of total print area
text: 44%; photo: 49%; map: 7%; diagram: 0%; graph: 0%; table: 1%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	9	33	56	11	33
Maps	1	100	0	0	100
Diagrams	0	0	0	0	0
Graphs	0	0	0	0	0
Tables	1	0	0	100	0
ALL ILLUSTRATIONS	11	36	46	18	36

BOOK NO: 39 SHORT TITLE: POXON & POXON; ASIA (58 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	179	56	31	1.81	35	51	49

Non-Experiential questions (N = 18):
Rhetorical: 6%; Confirming: 33%; Integrating: 44%; Open Ended: 11%;Valuing: 6%

Experiential questions (N = 17):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	24	12	0	0	35
Comparing	0	12	0	0	12
Organizing	18	6	6	0	29
Experimenting	0	0	0	0	0
Inferring	6	18	0	0	24
Applying	0	0	0	0	0
TOTAL %	47	47	6	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 65%;map 6%;diagram 6%;graph 6%;table 17%;other 0%

Proportions of total print area
text: 49%; photo: 45%; map: 1%; diagram: 2%; graph: 1%; table: 2%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	22	14	68	18	41
Maps	1	100	0	0	100
Diagrams	1	100	0	0	100
Graphs	1	100	0	0	100
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	26	27	58	15	50

BOOK NO: 40 SHORT TITLE: PREECE & WOOD; BRITISH ISLES (269 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
22	(11pages of Q/A at back of book: 4%)			2.6	35	97	3

Non-Experiential questions (N = 34):
Rhetorical: 0%; Confirming: 9%; Integrating: 88%; Open Ended: 3%;Valuing: 0%

Experiential questions (N = 1):
The one experiential activity required pupils to draw inferences from a table of figures and integrate the information with the accompanying description. The question was classified within the terms of the Textbook Questioning Strategy Assessment Instrument as requiring integration and inference.

Proportions of total print area
text: 75%; photo: 5%; map: 19%; diagram: 1%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	2	0	0	100	0
Maps	7	0	43	57	0
Diagrams	2	0	50	50	0
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	11	0	36	64	0

BOOK NO: 41 SHORT TITLE: M.C.U. WATER, ICE & WIND (32 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	224	64	29	2.67	30	7	93

Non-Experiential questions (N = 2):
Rhetorical: 0%; Confirming:100%; Integrating: 0%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 28):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	4	0	0	0	4
Communicating	7	0	0	0	7
Comparing	11	14	0	0	25
Organizing	32	0	0	0	32
Experimenting	0	0	0	0	0
Inferring	18	7	7	0	32
Applying	0	0	0	0	0
TOTAL %	71	21	7	0	100

References to resources in experiential questions/activities
atlas 10%;realia 10%;photo 35%;map 35%;diagram 10%;graph 0%;table 0%;other 0%
Proportions of total print area
text: 46%; photo: 22%; map: 22%; diagram: 10%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	13	31	15	54	46
Maps	8	75	0	25	75
Diagrams	4	50	0	50	75
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	25	48	8	44	60

BOOK NO: 42 **SHORT TITLE: RANDLE; WESTERN EUROPE** **(201pages of text)**

Proportion of text to questions and activities (Qu/Act)

Pages sampled	Sentences total	Sentences Q/A	Sentences %Q/A of text	Sentences av.length Q/A	Questions/Activities total	Questions/Activities %non-exper'l	Questions/Activities %exper'l
28	531	171	32	3.11	130	52	48

Non-Experiential questions (N = 67):
Rhetorical: 0%; Confirming: 36%; Integrating: 54%; Open Ended: 10%;Valuing: 0%

Experiential questions (N = 63):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	2	0	0	0	2
Communicating	14	5	0	0	19
Comparing	8	6	3	0	17
Organizing	10	6	2	0	17
Experimenting	0	0	0	0	0
Inferring	8	30	6	0	44
Applying	0	0	0	0	0
TOTAL %	41	48	11	0	100

References to resources in experiential questions/activities
atlas 24%;realia 0%;photo 8%;map 53%;diagram 10%;graph 0%;table 4%;other 0%
Proportions of total print area
text: 47%; photo: 8%; map: 39%; diagram: 3%; graph: 0%; table: 2%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	5	40	60	0	20
Maps	16	88	13	0	88
Diagrams	3	100	0	0	100
Graphs	0	0	0	0	0
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	25	80	20	0	76

BOOK NO: 43 SHORT TITLE: REDMORE; UNDER THE S.CROSS (194 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
28	290	72	25	2.77	60	22	78

Non-Experiential questions (N = 13):
Rhetorical: 8%; Confirming: 0%; Integrating: 77%; Open Ended: 15%;Valuing: 0%

Experiential questions (N = 47):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	9	0	0	0	9
Communicating	21	2	0	0	23
Comparing	6	9	2	0	17
Organizing	13	0	0	0	13
Experimenting	0	0	0	0	0
Inferring	17	19	0	0	36
Applying	2	0	0	0	2
TOTAL %	68	30	2	0	100

References to resources in experiential questions/activities
atlas 11%;realia 0%;photo 50%;map 25%;diagram 4%;graph 0%;table 11%;other 0%

Proportions of total print area
text: 61%; photo: 23%; map: 8%; diagram: 7%; graph: 0%; table: 1%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	45	9	45	64
Maps	2	50	0	50	0
Diagrams	8	13	13	75	25
Graphs	0	0	0	0	0
Tables	3	100	0	0	100
ALL ILLUSTRATIONS	24	42	8	50	50

BOOK NO: 44 SHORT TITLE: RICE; PATTERNS IN GEOGRAPHY ONE (88 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
12	200	130	65	4.48	57	19	81

Non-Experiential questions (N = 11):
Rhetorical: 0%; Confirming: 0%; Integrating: 73%; Open Ended: 27%;Valuing: 0%

Experiential questions (N = 46):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	7	2	0	0	9
Comparing	13	0	0	0	13
Organizing	22	2	0	0	24
Experimenting	7	0	0	0	7
Inferring	24	24	0	0	48
Applying	0	0	0	0	0
TOTAL %	72	28	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 14%;photo 21%;map 38%;diagram 17%;graph 3%;table 7%;other 0%

Proportions of total print area
text: 47%; photo: 25%; map: 7%; diagram: 19%; graph: 1%; table: 1%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	16	38	56	6	94
Maps	4	75	25	0	100
Diagrams	9	67	22	11	100
Graphs	1	100	0	0	100
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	31	55	39	6	97

BOOK NO: 45 SHORT TITLE: RICE; PATTERNS IN GEOGRAPHY THREE(89 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
12	139	79	57	1.65	50	2	98

Non-Experiential questions (N = 2):
Rhetorical: 0%; Confirming: 0%; Integrating: 0%; Open Ended: 100%; Valuing: 0%

Experiential questions (N = 49):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	12	10	0	0	22
Comparing	18	18	2	0	39
Organizing	22	0	0	0	22
Experimenting	0	0	0	0	0
Inferring	2	10	0	2	14
Applying	2	0	0	0	2
TOTAL %	57	39	2	2	100

References to resources in experiential questions/activities
atlas10%;realia 0%;photo 14%;map 28%;diagram 17%;graph 28%;table 3%;other 0%
Proportions of total print area
text: 36%; photo: 29%; map: 11%; diagram: 13%; graph: 7%; table: 4%

Position of questions
initiatory: 0%; contextual: 73%; terminal: 27%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	15	40	27	33	87
Maps	6	33	0	67	100
Diagrams	7	57	14	29	86
Graphs	6	67	0	33	100
Tables	4	100	0	0	100
ALL ILLUSTRATIONS	38	53	13	34	92

BOOK NO: 46 SHORT TITLE: ROLFE; O.G.P. 2 (112 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
16	168	63	38	2.63	37	22	78

Non-Experiential questions (N = 8):
Rhetorical: 0%; Confirming: 0%; Integrating: 88%; Open Ended: 13%;Valuing: 0%

Experiential questions (N = 29):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	3	0	0	0	3
Communicating	3	7	0	0	10
Comparing	28	3	0	0	31
Organizing	17	21	0	0	38
Experimenting	0	0	0	0	0
Inferring	0	14	3	0	17
Applying	0	0	0	0	0
TOTAL %	52	45	3	0	100

References to resources in experiential questions/activities
atlas 8%;realia 0%;photo 24%;map 40%;diagram 12%;graph 12%;table 4%;other 0%
Proportions of total print area
text: 25%; photo: 35%; map: 33%; diagram: 1%; graph: 5%; table: 1%

Position of questions
initiatory: 0%; contextual: 92%; terminal: 8%; captional: 0%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	22	5	18	77	86
Map	9	33	0	67	89
Diagrams	1	0	0	100	100
Graphs	1	0	0	100	100
Tables	1	0	0	100	100
ALL ILLUSTRATIONS	34	12	12	76	88

BOOK NO: 47 SHORT TITLE: RUSHBY et al.; STUDY GEOG. 1. (142 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
24	294	115	39	1.53	81	14	86

Non-Experiential questions (N = 11):
Rhetorical: 0%; Confirming: 36%; Integrating: 55%; Open Ended: 9%; Valuing: 0%

Experiential questions (N = 70):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	4	16	0	0	20
Comparing	11	4	6	0	21
Organizing	19	0	0	0	19
Experimenting	0	0	0	0	0
Inferring	26	14	0	0	40
Applying	0	0	0	0	0
TOTAL %	60	34	6	0	100

References to resources in experiential questions/activities
atlas 15%;realia 0%;photo 42%;map 26%;diagram 4%;graph 9%;table 2%;other 2%

Proportions of total print area
text: 38%; photo: 41%; map: 13%; diagram: 3%; graph: 2%; table: 2%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	26	50	23	27	62
Maps	10	90	0	10	70
Diagrams	4	75	25	0	25
Graphs	4	100	0	0	100
Tables	2	50	50	0	50
ALL ILLUSTRATIONS	46	65	17	17	63

BOOK NO: 48 SHORT TITLE: SAVORY; WALES (59 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	106	26	25	1.62	23	9	91

Non-Experiential questions (N = 2):

Rhetorical: 0%; Confirming: 0%; Integrating: 100%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 21):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	19	0	5	0	24
Comparing	0	19	0	0	19
Organizing	19	0	5	0	24
Experimenting	0	0	0	0	0
Inferring	19	10	5	0	33
Applying	0	0	0	0	0
TOTAL %	57	29	14	0	100

References to resources in experiential questions/activities

atlas 0%;realia 13%;photo 0%;map 69%;diagram 6%;graph 0%;table 13%;other 0%

Proportions of total print area

text: 40%; photo: 8%; map: 26%; diagram: 21%; graph: 0%; table: 5%

Position of questions

initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	1	0	0	100	100
Maps	4	25	25	50	50
Diagrams	3	33	0	67	100
Graphs	0	0	0	0	0
Tables	1	100	0	0	100
ALL ILLUSTRATIONS	9	33	11	56	78

BOOK NO: 49 SHORT TITLE: SAVORY; S.E. ENGLAND (66 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
18	221	58	26	2.42	50	8	92

Non-Experiential questions (N = 4):
Rhetorical: 0%; Confirming: 25%; Integrating: 75%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 46):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	13	2	2	0	17
Comparing	17	9	0	0	26
Organizing	17	0	0	0	17
Experimenting	0	0	0	0	0
Inferring	26	11	0	2	39
Applying	0	0	0	0	0
TOTAL %	74	22	2	2	100

References to resources in experiential questions/activities
atlas 0%;realia 10%;photo 24%;map 38%;diagram 21%;graph 0%;table 3%;other 3%

Proportions of total print area
text: 45%; photo: 21%; map: 32%; diagram: 2%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	6	0	17	83	83
Maps	11	0	9	91	100
Diagrams	2	0	0	100	100
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	19	0	10	89	95

BOOK NO: 50   SHORT TITLE: SIMONS; EUROPE & U.S.S.R.   (59 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
8	154	78	51	1.95	39	82	18

Non-Experiential questions (N = 32):
Rhetorical: 0%; Confirming: 94%; Integrating: 0%; Open Ended: 6%;Valuing: 0%

Experiential questions (N = 7):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	14	0	0	0	14
Comparing	29	0	0	0	29
Organizing	43	0	0	0	43
Experimenting	0	0	0	0	0
Inferring	0	14	0	0	14
Applying	0	0	0	0	0
TOTAL %	86	14	0	0	100

References to resources in experiential questions/activities
atlas 0%;realia 14%;photo 0%;map 72%;diagram 0%;graph 0%;table 0%;other 14%
Proportions of total print area
text: 46%; photo: 5%; map: 49%; diagram: 0%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	4	100	0	0	0
Maps	4	25	0	75	75
Diagrams	0	0	0	0	0
Graphs	0	0	0	0	0
Tables	0	0	0	0	0
ALL ILLUSTRATIONS	8	62	0	38	38

BOOK NO: 51 SHORT TITLE: TERRY; THE PHYSICAL LANDSCAPE (pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
10	184	35	19	2.69	23	26	74

Non-Experiential questions (N = 6):
Rhetorical: 0%; Confirming: 17%; Integrating: 83%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 17):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	12	29	0	0	41
Comparing	6	0	0	0	6
Organizing	6	0	0	0	6
Experimenting	0	0	0	0	0
Inferring	29	18	0	0	47
Applying	0	0	0	0	0
TOTAL %	53	47	0	0	100

References to resources in experiential questions/activities
atlas 18%;realia 9%;photo 46%;map 18%;diagram 0%;graph 0%;table 0%;other 9%
Proportions of total print area (of extracts given to pupils)
text: 63%; photo: none incl.; map: 12%; diagram: 26%; graph: 0%; table: 0%

Position of questions
initiatory: 0%; contextual: 0%; terminal: 100%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs *					
Maps *	4	75	25	0	0
Diagrams	9	56	44	0	0
ALL ILLUSTRATIONS	13	62	38	0	0

* The copies from the book presented to pupils included none of the photographs nor the extract from a topographical map referred to in the text.

BOOK NO: 52 SHORT TITLE: TOLSON & JOHNSTONE; BRITAIN (247 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
26	309	32	10	1.88	22	41	59

Non-Experiential questions (N = 9):
Rhetorical: 0%; Confirming: 22%; Integrating: 56%; Open Ended: 22%;Valuing: 0%

Experiential questions (N = 13):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	15	8	0	0	23
Communicating	8	0	0	0	8
Comparing	23	0	0	0	23
Organizing	31	8	0	0	38
Experimenting	0	0	0	0	0
Inferring	0	0	8	0	8
Applying	0	0	0	0	0
TOTAL %	77	15	8	0	100

References to resources in experiential questions/activities
atlas 0%;realia 0%;photo 38%;map 46%;diagram 0%;graph 0%;table 15%;other 0%
Proportions of total print area
text: 44%; photo: 19%; map: 28%; diagram: 2%; graph: 4%; table: 3%

Position of questions
initiatory: 0%; contextual: 12%; terminal: 53%; captional: 35%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	82	0	18	18
Maps	9	11	11	78	0
Diagrams	2	0	0	100	0
Graphs	3	0	0	100	0
Tables	2	100	0	0	100
ALL ILLUSTRATIONS	27	44	4	52	15

BOOK NO: 53 SHORT TITLE: WHITE; SPOTLIGHT ON EUROPE (63 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
12	182	90	49	2.43	59	32	68

Non-Experiential questions (N = 19):
Rhetorical: 11%; Confirming: 21%; Integrating: 37%; Open Ended: 32%;Valuing: 0%

Experiential questions (N = 40):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	13	3	0	0	15
Comparing	40	10	0	0	50
Organizing	8	5	3	0	15
Experimenting	0	0	0	0	0
Inferring	3	15	3	0	20
Applying	0	0	0	0	0
TOTAL %	63	33	5	0	100

References to resources in experiential questions/activities
atlas 11%;realia 0%;photo 0%;map 63%;diagram 3%;graph 0%;table 21%;other 3%
Proportions of total print area
text: 31%; photo: 34%; map: 25%; diagram: 4%; graph: 0%; table: 6%

Position of questions
initiatory: 0%; contextual: 92%; terminal: 8%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	6	83	0	17	50
Maps	5	0	40	60	100
Diagrams	1	0	0	100	100
Graphs	0	0	0	0	0
Tables	10	10	30	60	90
ALL ILLUSTRATIONS	22	27	23	50	82

BOOK NO: 54 SHORT TITLE: WILSON; LANGUAGE OF MAPS (49 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
10	229	55	24	1.38	45	0	100

Experiential questions (N = 45):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	0	13	0	0	13
Comparing	7	7	2	0	16
Organizing	9	0	0	0	9
Experimenting	0	0	0	0	0
Inferring	13	20	0	0	33
Applying	29	0	0	0	29
TOTAL %	58	40	2	0	100

References to resources in experiential questions/activities

atlas 0%;realia 0%;photo 12%;map 81%;diagram 7%;graph 0%;table 0%;other 0%

Proportions of total print area

text: 44%; photo: 19%; map: 27%; diagram: 2%; graph: 0%; table: 8%

Position of questions

initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	2	100	0	0	100
Maps	6	33	0	67	100
Diagrams	1	0	0	100	100
Graphs	0	0	0	0	0
Tables	1	0	0	100	0
ALL ILLUSTRATIONS	10	40	0	60	90

BOOK NO: 55 SHORT TITLE: WILSON; BRITISH ISLES (160 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
24							

This book included no questions or activities, and the author makes no use of rhetorical questions in his writing style.

Proportions of total print area

text: 63%; photo: 22%; map: 10%; diagram: 3%; graph: 0%; table: 2%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.
Photographs	21	0	29	71
Maps	12	0	25	75
Diagrams	2	0	50	50
Graphs	0	0	0	0
Tables	3	0	33	67
ALL ILLUSTRATIONS	38	0	29	71

BOOK NO: 56 SHORT TITLE: YOUNG & LOWRY; BRIT. ISLES (277 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
26	243	52	21	1.24	55	29	71

Non-Experiential questions (N = 16):
Rhetorical: 19%; Confirming: 38%; Integrating: 38%; Open Ended: 6%;Valuing: 0%

Experiential questions (N = 39):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	8	3	0	0	10
Communicating	0	13	0	0	13
Comparing	0	8	0	0	8
Organizing	21	8	0	0	28
Experimenting	0	0	0	0	0
Inferring	5	28	8	0	41
Applying	0	0	0	0	0
TOTAL %	33	59	8	0	100

References to resources in experiential questions/activities
atlas 5%;realia 0%;photo 27%;map 40%;diagram 15%;graph 0%;table 12%;other 2%

Proportions of total print area
text: 44%; photo: 24%; map: 16%; diagram: 6%; graph: 1%; table: 8%

Position of questions
initiatory: 7%; contextual: 88%; terminal: 0%; captional: 5%

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	16	25	44	31	25
Maps	19	47	11	42	58
Diagrams	3	33	67	0	67
Graphs	1	0	0	100	0
Tables	8	63	38	0	50
ALL ILLUSTRATIONS	47	40	30	30	45

BOOK NO: 57   SHORT TITLE: YOUNG & LOWRY; EUROPE   (262 pages of text)

Proportion of text to questions and activities (Qu/Act)

Pages	Sentences				Questions/Activities		
sampled	total	Q/A	%Q/A of text	av.length Q/A	total	%non-exper'l	%exper'l
24	325	54	17	1.46	37	30	70

Non-Experiential questions (N = 11):
Rhetorical: 0%; Confirming: 36%; Integrating: 64%; Open Ended: 0%;Valuing: 0%

Experiential questions (N = 26):

%	Confirming	Integrating	Open Ended	Valuing	Total
Observing	0	0	0	0	0
Communicating	19	8	0	0	27
Comparing	8	4	0	0	12
Organizing	30	0	0	0	30
Experimenting	0	0	0	0	0
Inferring	8	23	0	0	31
Applying	0	0	0	0	0
TOTAL %	65	35	0	0	100

References to resources in experiential questions/activities
atlas 18%;realia 0%;photo 5%;map 50%;diagram 5%;graph 0%;table 5%;other 0%

Proportions of total print area
text: 61%; photo: 20%; map: 14%; diagram: 2%; graph: 0%; table: 3%

Position of questions
initiatory: 0%; contextual: 100%; terminal: 0%; captional 0%.

References to illustrations

	N=100%	%No ref.	%Pass ref.	%Discuss.	%Used in Q/A.
Photographs	11	64	9	27	64
Maps	15	47	27	27	73
Diagrams	4	75	0	25	25
Graphs	0	0	0	0	0
Tables	6	100	0	0	83
ALL ILLUSTRATIONS	36	64	14	22	67

SUMMARY ANALYSIS OF BOOK 1: Ayers et al. Homescapes

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	43	25	19	8	1	4	57
Textual references to illustrations: None:	-	28	17	60	100	67	38
In passing:	-	7	33	20	0	0	10
Detailed:	-	66	50	20	0	33	52
Percentage of illustrations used in Questions/Activities	-	100	100	100	100	100	100

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 53

	Non-experiential	Experiential
Percentage of all Questions/Activities	17	83
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	64
Integrating	69	31
Open ended	31	3
Valuing	0	1

SUMMARY ANALYSIS OF BOOK 2: Ayers et al. Worldscapes

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	52	24	10	8	3	3	48
Textual references to illustrations: None:	-	21	13	44	20	40	26
In passing:	-	11	0	11	0	0	7
Detailed:	-	63	88	44	80	60	67
Percentage of illustrations used in Questions/Activities	-	79	25	67	60	100	67

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 38

	Non-experiential	Experiential
Percentage of all Questions/Activities	36	64
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	26	63
Integrating	61	30
Open ended	10	7
Valuing	3	0

SUMMARY ANALYSIS OF BOOK 3: Beddis *Asia and North America*

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		62	23	9	3	2	2	38
Textual references to illustrations:	None:	-	64	83	75	50	100	69
	In passing:	-	36	0	25	50	0	28
	Detailed:	-	0	17	0	0	0	3
Percentage of illustrations used in Questions/Activities		-	55	67	100	100	100	67

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 31

		Non-experiential	Experiential
Percentage of all Questions/Activities		56	44
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	27	57
	Integrating	52	41
	Open ended	21	2
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 4: Beddis *The Land and People of Britain*

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		54	26	10	8	1	1	46
Textual references to illustrations:	None:	-	11	0	0	0	0	5
	In passing:	-	56	100	57	100	100	68
	Detailed:	-	33	0	43	0	0	30
Percentage of illustrations used in Questions/Activities		-	44	75	57	100	100	59

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 48

		Non-experiential	Experiential
Percentage of all Questions/Activities		47	53
Percentage of each type of Question/Activity	Rhetorical	0	-
	Confirming	29	41
	Integrating	53	56
	Open ended	18	3
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 5: Bunnett Physical Geography in Diagrams

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	15	8	25	1	2	51
Textual references to illustrations: None:	-	46	14	6	100	50	20
In passing:	-	23	29	6	0	0	13
Detailed:	-	31	57	87	0	50	67
Percentage of illustrations used in Questions/Activities	-	8	0	6	100	0	7

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	91	9
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	72	83
Integrating	28	17
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 6: M.C.U. Earthquakes, Volcanoes and Mountains

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	21	15	24	0	0	61
Textual references to illustrations: None:	-	22	25	25	-	-	24
In passing:	-	56	50	13	-	-	38
Detailed:	-	22	25	63	-	-	38
Percentage of illustrations used in Questions/Activities	-	44	100	63	-	-	62

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 33

	Non-experiential	Experiential
Percentage of all Questions/Activities	6	94
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	72
Integrating	100	28
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 7: M.C.U. The Third World

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	35	35	15	14	0	0	1
Textual references to illustrations: None:	-	40	50	50	-	100	46
In passing:	-	7	0	0	-	0	4
Detailed:	-	53	50	50	-	0	50
Percentage of illustrations used in Questions/Activities	-	27	50	50	-	100	38

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 18

	Non-experiential	Experiential
Percentage of all Questions/Activities	61	39
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	7	22
Integrating	64	67
Open ended	14	11
Valuing	14	0

SUMMARY ANALYSIS OF BOOK 8: Crisp Food and Farming

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	19	42	0	30	6	3	81
Textual references to illustrations: None:	-	43	-	0	100	33	35
In passing:	-	57	-	60	0	33	47
Detailed:	-	0	-	40	0	33	18
Percentage of illustrations used in Questions/Activities	-	29	-	100	100	100	59

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 53

	Non-experiential	Experiential
Percentage of all Questions/Activities	11	89
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	88
Integrating	100	13
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 9: Crisp Towns

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	17	26	11	30	8	9	83
Textual references to illustrations: None:	-	0	0	100	0	100	40
In passing:	-	100	100	0	100	0	60
Detailed:	-	0	0	0	0	0	0
Percentage of illustrations used in Questions/Activities	-	100	100	100	100	100	100

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 78

		Non-experiential	Experiential
Percentage of all Questions/Activities		11	89
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	25	75
	Integrating	50	22
	Open ended	25	3
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 10: Crisp Fuel and Power

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	20	12	45	22	0	0	80
Textual references to illustrations: None:	-	100	0	0	-	-	20
In passing:	-	0	50	50	-	-	40
Detailed:	-	0	50	50	-	-	40
Percentage of illustrations used in Questions/Activities	-	100	100	75	-	-	90

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 57

		Non-experiential	Experiential
Percentage of all Questions/Activities		28	72
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	20	77
	Integrating	40	23
	Open ended	40	0
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 11: Crisp Transport

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		24	32	0	31	0	13	76
Textual references to illustrations:	None:	-	40	0	25	-	50	33
	In passing:	-	40	0	75	-	50	60
	Detailed:	-	20	0	0	-	0	7
Percentage of illustrations used in Questions/Activities		-	20	0	75	-	100	60

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 58

	Non-experiential	Experiential
Percentage of all Questions/Activities	12	88

Percentage of each type of Question/Activity

	Non-experiential	Experiential
Rhetorical	0	-
Confirming	0	81
Integrating	100	14
Open ended	0	5
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 12: Crisp Industry

Analysis of book structure

		Text	photo	map	diag	graph	table	all illust
Percentage of total print area:		32	32	23	10	3	0	68
Textual references to illustrations:	None:	-	71	50	0	50	-	53
	In passing:	-	0	50	50	50	-	29
	Detailed:	-	29	0	50	0	-	18
Percentage of illustrations used in Questions/Activities		-	43	100	100	100	-	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 41

	Non-experiential	Experiential
Percentage of all Questions/Activities	18	82

Percentage of each type of Question/Activity

	Non-experiential	Experiential
Rhetorical	0	-
Confirming	33	70
Integrating	67	30
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 13: Crisp Different Worlds

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	27	24	10	37	0	3	73
Textual references to illustrations: None:	-	75	100	50	-	100	67
In passing:	-	25	0	50	-	0	33
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	25	100	63	-	100	60

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 47

	Non-experiential	Experiential
Percentage of all Questions/Activities	29	71
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	25	55
Integrating	38	40
Open ended	0	5
Valuing	38	0

SUMMARY ANALYSIS OF BOOK 14: Dinkele Our Common Market Neighbours

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	15	12	0	15	10	51
Textual references to illustrations: None:	-	100	25	-	100	50	60
In passing:	-	0	25	-	0	0	10
Detailed:	-	0	50	-	0	50	30
Percentage of illustrations used in Questions/Activities	-	100	75	-	0	100	80

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 32

	Non-experiential	Experiential
Percentage of all Questions/Activities	31	69
Percentage of each type of Question/Activity		
Rhetorical	27	-
Confirming	0	42
Integrating	36	29
Open ended	36	17
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 15: Dobson and Virgo *The Elements of Geography*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	57	25	2	6	8	2	43
Textual references to illustrations: None:	-	100	100	13	50	100	55
In passing:	-	0	0	25	0	0	10
Detailed:	-	0	0	63	50	0	35
Percentage of illustrations used in Questions/Activities	-	83	0	13	0	0	30

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 16

		Non-experiential	Experiential
Percentage of all Questions/Activities		42	58
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	12	65
	Integrating	64	30
	Open ended	24	4
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 16: Dobson and Virgo *The British Isles*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	35	43	21	1	0	0	65
Textual references to illustrations: None:	-	100	90	100	-	-	96
In passing:	-	0	0	0	-	-	0
Detailed:	-	0	10	0	-	-	4
Percentage of illustrations used in Questions/Activities	-	92	60	0	0	0	74

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 16

		Non-experiential	Experiential
Percentage of all Questions/Activities		11	89
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	67	50
	Integrating	33	46
	Open ended	0	4
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 17: Dobson and Virgo North West Europe

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	35	32	26	1	4	2	65
Textual references to illustrations: None:	-	18	14	0	100	0	21
In passing:	-	27	14	0	0	100	21
Detailed:	-	55	71	100	0	0	58
Percentage of illustrations used in Questions/Activities	-	18	14	0	50	0	17

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 8

	Non-experiential	Experiential
Percentage of all Questions/Activities	60	40
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	33
Integrating	89	67
Open ended	11	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 18: Fawcett Spotlight on World Problems

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	43	12	21	14	8	2	57
Textual references to illustrations: None:	-	67	71	75	100	50	74
In passing:	-	33	29	25	0	50	26
Detailed:	-	0	0	0	0	0	0
Percentage of illustrations used in Questions/Activities	-	33	86	25	100	100	68

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 40

	Non-experiential	Experiential
Percentage of all Questions/Activities	51	49
Percentage of each type of Question/Activity		
Rhetorical	37	-
Confirming	4	64
Integrating	52	27
Open ended	7	7
Valuing	0	2

SUMMARY ANALYSIS OF BOOK 19: Fullager and Virgo*Map Reading & Local Studies*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	7	38	11	0	4	61
Textual references to illustrations: None:	-	100	67	25	-	0	50
In passing:	-	0	0	0	-	0	0
Detailed:	-	0	33	75	-	100	50
Percentage of illustrations used in Questions/Activities	-	100	83	50	-	100	81

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 20

	Non-experiential	Experiential
Percentage of all Questions/Activities	6	94
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	25
Integrating	0	75
Open ended	100	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 20: Goodson *The British Isles*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	31	42	21	5	1	0	69
Textual references to illustrations: None:	-	59	77	60	100	-	67
In passing:	-	36	8	0	0	-	21
Detailed:	-	5	15	40	0	-	12
Percentage of illustrations used in Questions/Activities	-	0	0	0	50	-	2

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 4

	Non-experiential	Experiential
Percentage of all Questions/Activities	80	20
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	50	100
Integrating	25	0
Open ended	25	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 21: Greasley et al. *Basic Geography 3*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	38	16	17	22	1	6	62
Textual references to illustrations: None:	-	91	75	60	50	50	73
In passing:	-	9	0	20	50	50	17
Detailed:	-	0	25	20	0	0	10
Percentage of illustrations used in Questions/Activities	-	64	100	80	100	50	77

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 45

	Non-experiential	Experiential
Percentage of all Questions/Activities	16	84
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	55
Integrating	67	29
Open ended	33	6
Valuing	0	9

SUMMARY ANALYSIS OF BOOK 22: Grenyer et al. *Oxford Geography Project 3*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	24	24	6	1	7	61
Textual references to illustrations: None:	-	46	38	25	0	43	40
In passing:	-	8	0	50	0	43	18
Detailed:	-	46	63	25	100	14	42
Percentage of illustrations used in Questions/Activities	-	46	88	50	100	100	58

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 41

	Non-experiential	Experiential
Percentage of all Questions/Activities	30	70
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	19	38
Integrating	50	57
Open ended	31	5
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 23: Hadlow Fundamental Geography 3

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	66	13	1	15	0	5	34
Textual references to illustrations: None:	-	100	0	9	-	43	46
In passing:	-	0	100	18	-	14	14
Detailed:	-	0	0	73	-	43	39
Percentage of illustrations used in Questions/Activities	-	22	0	9	-	29	18

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 8

	Non-experiential	Experiential
Percentage of all Questions/Activities	57	43
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	50
Integrating	100	50
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 24: Kimpton Understanding Developing Places

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	54	21	4	15	0	6	46
Textual references to illustrations: None:	-	25	0	0	-	50	22
In passing:	-	21	0	22	-	0	18
Detailed:	-	54	100	78	-	50	60
Percentage of illustrations used in Questions/Activities	-	75	50	67	-	100	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 34

	Non-experiential	Experiential
Percentage of all Questions/Activities	20	80
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	11	46
Integrating	89	54
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 25: Knights Farming in the British Isles

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	39	45	10	2	0	4	61
Textual references to illustrations: None:	-	0	0	0	-	0	0
In passing:	-	86	50	100	-	50	75
Detailed:	-	14	50	0	-	50	25
Percentage of illustrations used in Questions/Activities	-	100	100	100	-	100	100

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 50

	Non-experiential	Experiential
Percentage of all Questions/Activities	39	61
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	48	67
Integrating	52	33
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 26: Long and Roberson World Problems

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	22	23	2	1	3	50
Textual references to illustrations: None:	-	100	6	0	0	83	41
In passing:	-	0	33	0	100	0	19
Detailed:	-	0	61	100	0	17	41
Percentage of illustrations used in Questions/Activities	-	33	44	33	0	83	46

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 18

	Non-experiential	Experiential
Percentage of all Questions/Activities	49	51
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	22	75
Integrating	48	21
Open ended	30	4
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 27: M.C.U. Natural Disasters

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	37	36	17	4	0	6	63
Textual references to illustrations: None:	-	86	100	100	-	100	94
In passing:	-	14	0	0	-	0	6
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	14	25	0	-	0	12

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 6

	Non-experiential	Experiential
Percentage of all Questions/Activities	83	17
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	10	50
Integrating	80	50
Open ended	10	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 28: M.C.U. Reading Maps

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	50	22	15	13	0	0	50
Textual references to illustrations: None:	-	86	0	0	-	-	38
In passing:	-	0	33	0	-	-	6
Detailed:	-	14	67	100	-	-	56
Percentage of illustrations used in Questions/Activities	-	29	67	83	-	-	56

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 40

	Non-experiential	Experiential
Percentage of all Questions/Activities	5	95
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	74
Integrating	100	23
Open ended	0	3
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 29: Marsden North West England

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	22	27	2	0	0	51
Textual references to illustrations: None:	-	0	0	0	-	-	0
In passing:	-	0	0	0	-	-	0
Detailed:	-	100	100	100	-	-	100
Percentage of illustrations used in Questions/Activities	-	33	25	0	-	-	25

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 17

	Non-experiential	Experiential
Percentage of all Questions/Activities	43	57
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	11	75
Integrating	78	25
Open ended	11	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 30: Miller The Physical Basis of Geography

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	80	0	0	14	0	6	20
Textual references to illustrations: None:	-	-	-	0	-	0	0
In passing:	-	-	-	25	-	100	50
Detailed:	-	-	-	75	-	0	50
Percentage of illustrations used in Questions/Activities	-	-	-	17	-	0	11

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 15

	Non-experiential	Experiential
Percentage of all Questions/Activities	91	9
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	20	33
Integrating	57	67
Open ended	23	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 31: Money Basic Geography

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	51	4	8	31	3	3	49
Textual references to illustrations: None:	-	75	25	6	0	0	14
In passing:	-	0	0	10	25	0	9
Detailed:	-	25	75	84	75	100	77
Percentage of illustrations used in Questions/Activities	-	25	25	13	0	0	14

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	71	29
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	29
Integrating	97	71
Open ended	3	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 32: Money Introducing World Studies

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	58	31	7	4	0	0	42
Textual references to illustrations: None:	-	67	67	0	-	-	59
In passing:	-	25	33	100	-	-	35
Detailed:	-	8	0	0	-	-	6
Percentage of illustrations used in Questions/Activities	-	33	67	100	-	-	47

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 32

	Non-experiential	Experiential
Percentage of all Questions/Activities	37	63
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	20	73
Integrating	73	23
Open ended	7	0
Valuing	0	3

SUMMARY ANALYSIS OF BOOK 33: Morris British Isles

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	65	15	13	2	4	1	35
Textual references to illustrations: None:	-	100	92	100	100	100	97
In passing:	-	0	0	0	0	0	0
Detailed:	-	0	8	0	0	0	3
Percentage of illustrations used in Questions/Activities	-	0	0	0	0	100	5

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 7

	Non-experiential	Experiential
Percentage of all Questions/Activities	63	37
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	17	100
Integrating	75	0
Open ended	8	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 34: Morris Britain and Beyond

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	69	20	6	2	3	0	31
Textual references to illustrations: None:	-	0	0	0	50	-	5
In passing:	-	27	0	0	0	-	20
Detailed:	-	73	100	100	50	-	75
Percentage of illustrations used in Questions/Activities	-	67	50	100	100	-	70

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 26

	Non-experiential	Experiential
Percentage of all Questions/Activities	52	48
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	37	54
Integrating	60	43
Open ended	3	0
Valuing	0	3

SUMMARY ANALYSIS OF BOOK 35: M.C.U. South East England

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	42	20	14	21	0	3	58
Textual references to illustrations: None:	-	86	100	80	-	100	88
In passing:	-	0	0	0	-	0	0
Detailed:	-	14	0	20	-	0	12
Percentage of illustrations used in Questions/Activities	-	14	67	20	-	0	25

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 18

	Non-experiential	Experiential
Percentage of all Questions/Activities	57	43
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	38	83
Integrating	63	0
Open ended	0	17
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 36: M.C.U. London

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	26	26	35	9	0	4	74
Textual references to illustrations: None:	-	100	80	100	-	0	82
In passing:	-	0	20	0	-	33	9
Detailed:	-	0	0	0	-	67	9
Percentage of illustrations used in Questions/Activities	-	0	60	100	-	100	36

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	21	79
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	33	55
Integrating	0	45
Open ended	67	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 37: M.C.U. Farming and Fishing in Britain

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	48	35	1	8	1	7	52
Textual references to illustrations: None:	-	91	50	100	100	50	76
In passing:	-	0	50	0	0	50	19
Detailed:	-	9	0	0	0	0	5
Percentage of illustrations used in Questions/Activities	-	9	50	67	100	50	33

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 10

	Non-experiential	Experiential
Percentage of all Questions/Activities	61	39
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	14	56
Integrating	50	44
Open ended	36	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 38: Phillips and Phillips West Africa

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	49	7	0	0	1	56
Textual references to illustrations: None:	-	33	100	-	-	0	36
In passing:	-	56	0	-	-	0	46
Detailed:	-	11	0	-	-	100	18
Percentage of illustrations used in Questions/Activities	-	33	100	-	-	0	36

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 14

	Non-experiential	Experiential
Percentage of all Questions/Activities	33	67
Percentage of each type of Question/Activity		
Rhetorical	17	-
Confirming	17	92
Integrating	49	0
Open ended	17	8
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 39: Poxon and Poxon *Asia*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	49	45	1	2	1	2	51
Textual references to illustrations: None:	-	14	100	100	100	100	27
In passing:	-	68	0	0	0	0	58
Detailed:	-	18	0	0	0	0	15
Percentage of illustrations used in Questions/Activities	-	41	100	100	100	100	50

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 31

	Non-experiential	Experiential
Percentage of all Questions/Activities	51	49
Percentage of each type of Question/Activity		
Rhetorical	6	-
Confirming	33	47
Integrating	44	47
Open ended	11	6
Valuing	6	0

SUMMARY ANALYSIS OF BOOK 40: Preece and Wood *The British Isles*

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	75	5	19	1	0	0	25
Textual references to illustrations: None:	-	0	0	0	-	-	0
In passing:	-	0	43	50	-	-	36
Detailed:	-	100	57	50	-	-	64
Percentage of illustrations used in Questions/Activities	-	0	0	0	-	-	0

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 4

	Non-experiential	Experiential
Percentage of all Questions/Activities	97	3
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	9	-
Integrating	88	-
Open ended	3	-
Valuing	0	-

SUMMARY ANALYSIS OF BOOK 41: M.C.U. Water, Ice and Wind

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	46	22	22	10	0	0	54
Textual references to illustrations: None:	-	31	75	50	-	-	48
In passing:	-	15	0	0	-	-	8
Detailed:	-	54	25	50	-	-	44
Percentage of illustrations used in Questions/Activities	-	46	75	75	-	-	60

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 29

		Non-experiential	Experiential
Percentage of all Questions/Activities		7	93
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	100	71
	Integrating	0	21
	Open ended	0	7
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 42: Randle Geographical Studies in Western Europe

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	8	39	3	0	2	53
Textual references to illustrations: None:	-	40	88	100	-	100	80
In passing:	-	60	13	0	-	0	20
Detailed:	-	0	0	0	-	0	0
Percentage of illustrations used in Questions/Activities	-	20	88	100	-	100	76

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 32

		Non-experiential	Experiential
Percentage of all Questions/Activities		52	48
Percentage of each type of Question/Activity			
	Rhetorical	0	-
	Confirming	36	41
	Integrating	54	48
	Open ended	10	11
	Valuing	0	0

SUMMARY ANALYSIS OF BOOK 43: Redmore Under the Southern Cross

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	61	23	8	7	0	1	39
Textual references to illustrations: None:	-	45	50	13	-	100	42
In passing:	-	9	0	13	-	0	8
Detailed:	-	45	50	75	-	0	50
Percentage of illustrations used in Questions/Activities	-	64	0	25	-	100	50

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	22	78
Percentage of each type of Question/Activity		
Rhetorical	8	-
Confirming	0	68
Integrating	77	30
Open ended	15	2
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 44: Rice Patterns in Geography One

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	47	25	7	19	1	1	53
Textual references to illustrations: None:	-	38	75	67	100	100	55
In passing:	-	56	25	22	0	0	39
Detailed:	-	6	0	11	0	0	6
Percentage of illustrations used in Questions/Activities	-	94	100	100	100	100	97

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 65

	Non-experiential	Experiential
Percentage of all Questions/Activities	19	81
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	72
Integrating	73	28
Open ended	27	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 45: Rice Patterns in Geography Three

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	36	29	11	13	7	4	64
Textual references to illustrations: None:	-	40	33	57	67	100	53
In passing:	-	27	0	14	0	0	13
Detailed:	-	33	67	29	33	0	34
Percentage of illustrations used in Questions/Activities	-	87	100	86	100	100	92

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 57

	Non-experiential	Experiential
Percentage of all Questions/Activities	2	98
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	57
Integrating	0	39
Open ended	100	2
Valuing	0	2

SUMMARY ANALYSIS OF BOOK 46: Rolfe et al. Oxford Geography Project 2

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	25	35	33	1	5	1	75
Textual references to illustrations: None:	-	5	33	0	0	0	12
In passing:	-	18	0	0	0	0	12
Detailed:	-	77	67	100	100	100	76
Percentage of illustrations used in Questions/Activities	-	86	89	100	100	100	88

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 38

	Non-experiential	Experiential
Percentage of all Questions/Activities	22	78
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	52
Integrating	88	45
Open ended	13	3
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 47: Rushby et al. Study Geography Stage 1

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	38	41	13	3	2	2	62
Textual references to illustrations: None:	-	50	90	75	100	50	65
In passing:	-	23	0	25	0	50	17
Detailed:	-	27	10	0	0	0	17
Percentage of illustrations used in Questions/Activities	-	62	70	25	100	50	63

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 39

	Non-experiential	Experiential
Percentage of all Questions/Activities	14	86
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	36	60
Integrating	55	34
Open ended	9	6
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 48: Savory A Geography of Wales

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	40	8	26	21	0	5	60
Textual references to illustrations: None:	-	0	25	33	-	100	33
In passing:	-	0	25	0	-	0	11
Detailed:	-	100	50	67	-	0	56
Percentage of illustrations used in Questions/Activities	-	100	50	100	-	100	78

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 25

	Non-experiential	Experiential
Percentage of all Questions/Activities	9	91
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	0	57
Integrating	100	29
Open ended	0	14
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 49: South East England

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	45	21	32	2	0	0	55
Textual references to illustrations: None:	-	0	0	0	-	-	0
In passing:	-	17	9	0	-	-	10
Detailed:	-	83	91	100	-	-	89
Percentage of illustrations used in Questions/Activities	-	83	100	100	-	-	95

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 26

	Non-experiential	Experiential
Percentage of all Questions/Activities	8	92
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	25	74
Integrating	75	22
Open ended	0	2
Valuing	0	2

SUMMARY ANALYSIS OF BOOK 50: Simons Europe and the U.S.S.R.

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	46	5	49	0	0	0	54
Textual references to illustrations: None:	-	100	25	-	-	-	62
In passing:	-	0	0	-	-	-	0
Detailed:	-	0	75	-	-	-	38
Percentage of illustrations used in Questions/Activities	-	0	75	-	-	-	38

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 51

	Non-experiential	Experiential
Percentage of all Questions/Activities	82	18
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	94	86
Integrating	0	14
Open ended	6	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 51: Terry The Physical Landscape

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	63	-	12	26	0	0	37
Textual references to illustrations: None:	-	-	75	56	-	-	62
In passing:	-	-	25	44	-	-	38
Detailed:	-	-	0	0	-	-	0
Percentage of illustrations used in Questions/Activities	-	-	100	0	-	-	-

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 19

	Non-experiential	Experiential
Percentage of all Questions/Activities	26	74
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	17	53
Integrating	83	47
Open ended	0	0
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 52: Tolson and Johnstone A Geography of Britain

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	19	28	2	4	3	56
Textual references to illustrations: None:	-	82	11	0	0	100	44
In passing:	-	0	11	0	0	0	4
Detailed:	-	18	78	100	100	0	52
Percentage of illustrations used in Questions/Activities	-	18	0	0	0	100	15

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 10

	Non-experiential	Experiential
Percentage of all Questions/Activities	41	59
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	22	77
Integrating	56	15
Open ended	22	8
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 53: White Spotlight on Europe

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	31	34	25	4	0	6	69
Textual references to illustrations: None:	-	83	0	0	-	10	27
In passing:	-	0	40	0	-	30	23
Detailed:	-	17	60	100	-	60	50
Percentage of illustrations used in Questions/Activities	-	50	100	100	-	90	82

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 49

	Non-experiential	Experiential
Percentage of all Questions/Activities	32	68
Percentage of each type of Question/Activity		
Rhetorical	11	-
Confirming	21	63
Integrating	37	33
Open ended	32	5
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 54: Wilson Language of Maps

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	19	27	2	0	8	56
Textual references to illustrations: None:	-	100	33	0	-	0	40
In passing:	-	0	0	0	-	0	0
Detailed:	-	0	67	100	-	100	60
Percentage of illustrations used in Questions/Activities	-	100	100	100	-	0	90

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 24

	Non-experiential	Experiential
Percentage of all Questions/Activities	0	100
Percentage of each type of Question/Activity		
Rhetorical	-	-
Confirming	-	58
Integrating	-	40
Open ended	-	2
Valuing	-	0

SUMMARY ANALYSIS OF BOOK 55: Wilson *The British Isles*

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	63	22	10	3	0	2	37
Textual references to illustrations: None:	-	0	0	0	-	0	0
In passing:	-	29	25	50	-	33	29
Detailed:	-	71	75	50	-	67	71
Percentage of illustrations used in Questions/Activities	-	-	-	-	-	-	-

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 0

SUMMARY ANALYSIS OF BOOK 56: Young and Lowry *The British Isles*

Analysis of book structure	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	44	24	16	6	1	8	56
Textual references to illustrations: None:	-	25	47	33	0	63	40
In passing:	-	44	11	67	0	38	30
Detailed:	-	31	42	0	100	0	30
Percentage of illustrations used in Questions/Activities	-	25	58	67	0	50	45

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 21

	Non-experiential	Experiential
Percentage of all Questions/Activities	29	71
Percentage of each type of Question/Activity		
Rhetorical	19	-
Confirming	38	33
Integrating	38	59
Open ended	6	8
Valuing	0	0

SUMMARY ANALYSIS OF BOOK 57: Young and Lowry Europe and the Soviet Union

Analysis of book structure

	Text	photo	map	diag	graph	table	all illust
Percentage of total print area:	61	20	14	2	0	3	39
Textual references to illustrations: None:	-	64	47	75	-	100	64
In passing:	-	9	27	0	-	0	14
Detailed:	-	27	27	25	-	0	22
Percentage of illustrations used in Questions/Activities	-	64	73	25	-	83	67

Analysis of Questions/Activities

Percentage of text devoted to Questions/Activities: 17

	Non-experiential	Experiential
Percentage of all Questions/Activities	30	70
Percentage of each type of Question/Activity		
Rhetorical	0	-
Confirming	36	65
Integrating	64	35
Open ended	0	0
Valuing	0	0

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 1 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in Book No. 3: Beddis; Asia & North America

	Mean	S.D.	N.	Rank
Text	2.000	0.649	20	1
Photos	2.500	0.827	20	2
Maps	2.800	0.696	20	3
Diags	2.900	0.912	20	5
Graphs	2.850	0.988	20	4
Tables	3.100	1.071	20	6

Pupil perception of the use of the various modes of data presentation in Book No. 39: Poxon & Poxon; Asia

	Mean	S.D.	N.	Rank
Text	2.450	0.945	20	2
Photos	1.950	0.887	20	1
Maps	2.750	0.786	20	3
Diags	3.100	0.912	20	4
Graphs	3.450	0.945	20	5
Tables	3.750	0.910	20	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.842	0.765	19	1
Photos	2.579	0.961	19	3
Maps	2.368	0.761	19	2
Diags	2.842	1.214	19	5
Graphs	2.684	1.157	19	4
Tables	2.947	1.177	18	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.317	0.646	20	2
Photos	2.575	0.720	20	5
Maps	2.375	0.935	20	3
Diags	2.533	0.889	20	4
Graphs	2.233	0.805	20	1
Tables	3.017	0.851	20	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 1 CLASS NO. 4

Pupil perception of the use of the various modes of data presentation in Book No. 4: Beddis; The Land & People of Britain

	Mean	S.D.	N.	Rank
Text	2.167	0.835	12	1
Photos	2.417	0.996	12	2
Maps	3.167	1.115	12	4
Diags	2.917	1.084	12	3
Graphs	3.583	1.311	12	6
Tables	3.167	0.937	12	4

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.909	0.701	11	1
Photos	3.182	0.603	11	4
Maps	2.455	0.934	11	2
Diags	2.500	1.080	10	3
Graphs	3.182	1.401	11	4
Tables	3.364	0.809	11	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.417	0.618	12	4
Photos	2.486	0.897	12	5
Maps	2.375	0.785	12	3
Diags	2.208	0.667	12	1
Graphs	2.347	1.011	12	2
Tables	2.556	0.604	12	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 2 CLASS NO. 1

Pupil perception of the use of the various modes of data presentation in
Book No. 37: M.C.U. farming and Fishing

	Mean	S.D.	N.	Rank
Text	1.867	0.571	30	1
Photos	2.000	0.947	30	2
Maps	2.367	0.809	30	4
Diags	2.000	0.788	30	2
Graphs	3.167	0.950	30	6
Tables	2.800	0.887	30	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.800	0.925	30	1
Photos	4.333	0.758	30	6
Maps	2.600	0.814	30	3
Diags	1.933	0.640	30	2
Graphs	3.467	0.973	30	5
Tables	3.367	0.765	30	4

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.444	0.427	30	3
Photos	2.667	0.603	30	4
Maps	2.250	0.541	30	2
Diags	2.106	0.585	30	1
Graphs	2.867	0.798	30	5
Tables	3.089	0.834	30	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 2 CLASS NO. 4

Pupil perception of the use of the various modes of data presentation in
Book No. 36: M.C.U. London

	Mean	S.D.	N.	Rank
Text	1.952	0.590	21	2
Photos	2.286	1.419	21	4
Maps	1.524	0.512	21	1
Diags	2.048	0.669	21	3
Graphs	3.381	0.740	21	5
Tables	3.381	0.669	21	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	2.450	1.099	21	3
Photos	3.950	0.826	20	6
Maps	1.750	0.716	20	2
Diags	1.550	0.605	20	1
Graphs	3.400	0.821	20	4
Tables	3.500	0.761	21	5

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.697	0.446	21	4
Photos	2.675	1.036	21	3
Maps	2.524	0.812	21	2
Diags	2.830	0.610	21	1
Graphs	3.262	0.733	21	5
Tables	3.540	0.738	21	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 3 CLASS NO. 2

Pupil perception of the use of the various modes of data presentation in Book No. 30: Miller; Physical Basis of Geography

	Mean	S.D.	N.	Rank
Text	1.767	0.728	30	1
Photos	3.867	0.629	30	5
Maps	3.467	0.937	30	4
Diags	2.033	0.765	30	2
Graphs	4.133	1.008	30	6
Tables	3.267	1.048	30	3

Pupil perception of the use of the various modes of data presentation in Book No. 31: Money; Basic Geography

	Mean	S.D.	N.	Rank
Text	1.867	0.571	30	2
Photos	2.033	1.033	30	3
Maps	2.433	1.040	30	4
Diags	1.533	0.681	30	1
Graphs	3.400	0.894	30	5
Tables	3.600	0.932	30	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.833	0.874	30	1
Photos	3.933	1.081	30	5
Maps	3.233	1.006	30	4
Diags	2.033	0.890	30	2
Graphs	3.967	0.999	30	6
Tables	2.800	0.925	30	3

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.794	0.669	30	4
Photos	2.667	0.739	30	2
Maps	2.717	0.872	30	3
Diags	2.239	0.849	30	1
Graphs	3.017	0.713	30	5
Tables	3.244	0.755	30	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 3 CLASS NO. 4

Pupil perception of the use of the various modes of data presentation in
Book No. 52: Tolson & Johnstone; Geog. of Britain

	Mean	S.D.	N.	Rank
Text	1.875	0.850	24	1
Photos	3.333	1.090	24	4
Maps	2.750	0.847	24	2
Diags	3.208	0.884	24	3
Graphs	4.083	0.654	24	6
Tables	3.542	0.779	24	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.583	0.584	24	1
Photos	4.250	0.608	24	6
Maps	2.833	0.637	24	2
Diags	2.875	0.850	24	3
Graphs	4.083	0.929	24	5
Tables	3.625	1.013	24	4

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.653	0.579	24	3
Photos	2.750	0.812	24	4
Maps	2.458	0.632	24	1
Diags	2.542	0.852	24	2
Graphs	2.882	0.895	24	5
Tables	3.118	1.112	24	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 4 CLASS NO. 4

Pupil perception of the use of the various modes of data presentation in
Book No. 55: Wilson; The British Isles

	Mean	S.D.	N.	Rank
Text	1.793	0.726	29	1
Photos	3.414	0.946	29	4
Maps	2.276	0.841	29	2
Diags	2.241	0.988	29	3
Graphs	3.414	0.825	29	4
Tables	3.621	0.677	29	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.621	0.728	29	1
Photos	3.586	0.825	29	5
Maps	2.000	0.707	29	2
Diags	2.207	0.940	29	3
Graphs	3.517	1.090	29	4
Tables	3.690	0.660	29	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.431	0.637	29	3
Photos	2.512	0.842	29	4
Maps	2.224	0.600	29	1
Diags	2.316	0.732	29	2
Graphs	2.764	0.612	29	5
Tables	2.787	0.648	29	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 5 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in
Book No.22: Grenyer; Oxford Geography Project 3

	. Mean .	S.D. .	N .	.Rank.
Text	2.370	0.688	27	2
Photos	2.222	0.577	27	1
Maps	2.556	0.934	27	4
Diags	2.519	0.935	27	3
Graphs	2.577	0.945	26	5
Tables	2.667	1.109	27	6

Pupil perception of the use of the various modes of data presentation in
Book No.21: Greasley; Basic Geography 3

	. Mean .	S.D. .	N .	.Rank.
Text	2.538	1.067	26	1
Photos	2.577	1.057	26	3
Maps	2.538	1.334	26	1
Diags	2.692	1.320	26	4
Graphs	2.692	1.123	26	4
Tables	2.769	1.243	26	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	. Mean .	S.D. .	N .	.Rank.
Text	2.308	1.087	27	3
Photos	2.346	1.892	27	4
Maps	2.500	0.949	27	5
Diags	2.192	0.849	27	1
Graphs	2.269	0.778	27	2
Tables	2.577	1.102	27	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	. Mean .	S.D. .	N .	.Rank.
Text	2.953	0.765	25	3
Photos	2.747	0.640	25	2
Maps	3.007	0.721	25	4
Diags	2.667	0.927	25	1
Graphs	3.520	0.818	25	6
Tables	3.420	0.645	25	5

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 6 CLASS NO. 2

Pupil perception of the use of the various modes of data presentation in
Book No.43: Redmore; Under the Southern Cross

	. Mean .	S.D. .	N .	.Rank.
Text	1.600	0.500	25	1
Photos	2.64	0.757	25	3
Maps	2.600	0.866	25	2
Diags	2.680	1.030	25	4
Graphs	4.84	0.473	25	6
Tables	4.680	0.69	25	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	. Mean .	S.D. .	N .	.Rank.
Text	1.640	0.860	25	1
Photos	2.480	0.586	25	4
Maps	2.440	1.044	25	2
Diags	2.520	0.918	25	3
Graphs	4.720	0.542	25	5
Tables	4.640	0.700	25	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	. Mean .	S.D. .	N .	.Rank.
Text	2.280	0.524	25	1
Photos	2.480	0.600	25	4
Maps	2.400	0.593	25	3
Diags	2.340	0.533	25	2
Graphs	2.833	0.506	24	5
Tables	3.222	0.712	24	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 6 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in
Book No.42: Randle; Western Europe

	Mean	S.D.	N	Rank
Text	1.963	0.649	27	1
Photos	3.667	0.961	27	6
Maps	2.222	0.892	27	2
Diags	2.593	1.083	27	4
Graphs	2.222	1.121	27	2
Tables	2.852	0.864	27	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N	Rank
Text	1.889	0.801	27	1
Photos	3.815	0.962	27	6
Maps	1.963	0.587	27	2
Diags	2.481	0.849	27	3
Graphs	2.778	1.050	27	4
Tables	3.074	0.917	27	5

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N	Rank
Text	2.080	0.409	27	2
Photos	2.340	0.561	27	4
Maps	1.944	0.627	27	1
Diags	2.302	0.767	27	3
Graphs	2.543	0.688	27	5
Tables	3.025	0.879	27	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 7 CLASS NO. 1

Pupil perception of the use of the various modes of data presentation in Book No.44: Rice; Patterns in Geography One

	Mean	S.D.	N	Rank
Text	1.531	0.567	32	1
Photos	1.968	0.912	31	2
Maps	3.156	0.954	32	4
Diags	2.656	1.004	32	3
Graphs	3.406	0.875	32	6
Tables	3.188	0.821	32	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N	Rank
Text	1.875	0.833	32	1
Photos	2.875	1.157	32	2
Maps	3.219	1.070	30	5
Diags	2.968	1.016	30	3
Graphs	3.200	0.961	30	4
Tables	3.355	0.839	31	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N	Rank
Text	2.281	0.666	32	4
Photos	2.042	0.693	32	1
Maps	2.219	0.926	32	3
Diags	2.094	0.699	32	2
Graphs	2.245	0.748	32	5
Tables	2.703	0.818	32	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 7 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in Book No.27: M.C.U.; Natural Disasters

	Mean	S.D.	N	Rank
Text	2.097	0.597	31	2
Photos	1.839	1.068	32	1
Maps	2.774	1.117	31	4
Diags	2.226	0.717	31	3
Graphs	3.387	0.803	30	6
Tables	3.129	0.922	31	5

Pupil perception of the use of the various modes of data presentation in Book No. 7: M.C.U.; The Third World

	Mean	S.D.	N	Rank
Text	1.935	0.727	31	1
Photos	1.968	0.948	31	2
Maps	2.419	0.848	31	4
Diags	2.323	1.013	31	3
Graphs	2.903	0.870	31	5
Tables	3.129	1.088	31	6

Pupil perception of the use of the various modes of data presentation in Book No.18: Fawcett; Spotlight on World Problems

	Mean	S.D.	N	Rank
Text	1.484	0.570	31	1
Photos	2.387	0.882	31	2
Maps	2.484	0.811	29	3
Diags	2.677	0.945	31	4
Graphs	3.161	0.934	31	6
Tables	2.839	0.860	31	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N	Rank
Text	1.516	0.508	31	1
Photos	2.194	0.980	31	4
Maps	1.903	0.944	31	2
Diags	2.258	0.965	31	5
Graphs	2.387	1.145	31	6
Tables	2.161	0.860	31	3

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N	Rank
Text	2.479	0.557	31	4
Photos	2.108	0.692	31	1
Maps	2.280	0.730	31	2
Diags	2.328	0.544	31	3
Graphs	2.500	0.624	31	5
Tables	2.893	0.665	31	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 8 CLASS NO. 1.

Pupil perception of the use of the various modes of data presentation in Book No. 44: Rice; Patterns in Geography One

	. Mean .	S.D. .	N .	.Rank.
Text	2.111	0.698	27	2
Photos	2.037	0.898	27	1
Maps	3.185	0.834	27	5
Diags	2.519	1.189	27	3
Graphs	2.963	0.759	27	4
Tables	3.444	0.751	27	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	. Mean .	S.D. .	N .	.Rank.
Text	1.778	0.847	27	1
Photos	3.000	1.177	27	4
Maps	3.259	0.764	27	5
Diags	2.222	0.801	27	2
Graphs	2.926	1.072	27	3
Tables	3.519	0.753	27	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	. Mean .	S.D. .	N .	.Rank.
Text	2.351	0.603	27	4
Photos	2.284	0.720	27	3
Maps	2.525	0.728	27	5
Diags	2.037	0.591	27	1
Graphs	2.253	0.605	27	2
Tables	3.216	0.879	27	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 8 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in
Book No. 18: Fawcett; Spotlight on World Problems

	. Mean .	S.D. .	N .	.Rank.
Text	2.345	0.974	29	2
Photos	1.724	0.882	29	1
Maps	2.897	1.113	29	4
Diags	2.655	1.143	29	3
Graphs	3.655	1.010	29	5
Tables	3.897	0.817	29	6

Pupil perception of the use of the various modes of data presentation in
Book No. 45: Rice; Patterns in Geography Three

	. Mean .	S.D. .	N .	.Rank.
Text	1.793	0.620	29	1
Photos	2.172	0.928	29	2
Maps	2.793	0.940	29	4
Diags	2.724	0.960	29	3
Graphs	2.931	1.163	29	6
Tables	3.621	0.979	29	5

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	. Mean .	S.D. .	N .	.Rank.
Text	1.379	0.494	29	1
Photos	2.931	0.961	29	6
Maps	2.828	0.711	29	5
Diags	2.276	0.996	29	3
Graphs	2.207	0.940	29	2
Tables	2.517	0.829	29	4

Pupil assessment of the various modes of data presentation encountered in their lessons

	. Mean .	S.D. .	N .	.Rank.
Text	2.523	0.505	29	3
Photos	2.730	0.759	29	5
Maps	2.512	0.773	29	2
Diags	2.092	0.507	29	1
Graphs	2.632	0.768	29	4
Tables	3.195	0.807	29	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 9 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in Book No.25: Knights; Farming in the British Isles

	Mean	S.D.	N	Rank
Text	2.000	0.535	22	2
Photos	1.227	0.685	22	1
Maps	3.318	0.568	22	3
Diags	3.500	0.802	22	6
Graphs	3.409	0.734	22	5
Tables	3.364	0.727	22	4

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N	Rank
Text	2.364	0.790	22	1
Photos	2.727	0.935	22	2
Maps	2.955	0.575	22	3
Diags	3.864	0.640	22	5
Graphs	4.045	0.950	22	6
Tables	3.545	0.858	22	4

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N	Rank
Text	2.644	0.505	22	3
Photos	2.364	0.890	22	1
Maps	2.758	0.703	22	4
Diags	2.515	0.579	22	2
Graphs	3.068	0.644	22	5
Tables	3.402	0.640	22	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 9 CLASS NO. 4

Pupil perception of the use of the various modes of data presentation in
Book No. 19: Fullager & Virgo; Map Reading

	Mean	S.D.	N.	Rank
Text	2.357	0.745	14	3
Photos	2.286	0.914	14	2
Maps	1.143	0.363	14	1
Diags	2.429	0.938	14	4
Graphs	3.857	0.535	14	5
Tables	3.857	0.535	14	5

Pupil perception of the use of the various modes of data presentation in
Book No. 33: Morris; British Isles

	Mean	S.D.	N.	Rank
Text	1.786	0.699	14	1
Photos	2.143	0.77	14	3
Maps	1.857	0.770	14	2
Diags	3.000	0.877	14	4
Graphs	3.643	0.497	14	5
Tables	3.714	0.611	14	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	3.000	0.784	3.056	3
Photos	3.071	0.829	3.125	4
Maps	1.429	0.646	1.278	1
Diags	2.714	0.726	2.833	2
Graphs	3.643	0.497	3.722	5
Tables	3.857	0.363	3.917	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.893	0.442	14	4
Photos	2.667	0.734	14	2
Maps	2.298	0.516	14	1
Diags	2.702	0.536	14	3
Graphs	2.893	0.460	14	4
Tables	3.381	0.529	14	6

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 10 CLASS NO. 3

Pupil perception of the use of the various modes of data presentation in
Book No. 45: Rice; Patterns in Geography Three

	Mean	S.D.	N.	Rank
Text	1.920	0.812	25	1
Photos	1.960	0.841	25	2
Maps	2.800	0.707	25	3
Diags	2.960	0.790	25	5
Graphs	2.920	0.909	25	4
Tables	3.000	0.816	25	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.600	0.645	25	1
Photos	1.880	0.971	25	2
Maps	2.880	0.866	25	5
Diags	2.680	0.748	25	3
Graphs	2.760	0.879	25	4
Tables	3.250	0.944	25	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.553	0.666	25	2
Photos	2.060	0.634	25	1
Maps	2.700	0.814	25	4
Diags	2.687	0.749	25	3
Graphs	2.847	0.937	25	5
Tables	2.935	0.831	25	6

APPENDIX L.

PUPIL PERCEPTIONS AND ASSESSMENTS OF THE ELEMENTS OF THEIR TEXT BOOKS AND LESSONS

TEACHER NO. 10 CLASS NO.4

Pupil perception of the use of the various modes of data presentation in
Book No.57: Young & Lowry; Europe & Soviet Union

	Mean	S.D.	N.	Rank
Text	1.632	0.684	19	1
Photos	2.105	0.809	19	2
Maps	2.263	1.046	19	3
Diags	2.684	0.946	19	4
Graphs	3.000	0.816	19	5
Tables	3.211	1.084	19	6

Pupil perception of the use of the various modes of data presentation in
Book No. 46: Rolfe et al.; O.G.P. 2

	Mean	S.D.	N.	Rank
Text	2.421	0.494	19	2
Photos	1.842	0.898	19	1
Maps	2.842	1.068	19	3
Diags	2.895	0.937	19	4
Graphs	3.368	0.895	19	5
Tables	3.632	0.895	19	6

Pupil perception of the use of the various modes of data presentation in their Geography lessons

	Mean	S.D.	N.	Rank
Text	1.526	0.612	19	1
Photos	2.611	0.778	19	4
Maps	2.053	0.911	19	2
Diags	2.333	0.840	19	3
Graphs	2.737	0.653	19	5
Tables	3.316	1.057	19	6

Pupil assessment of the various modes of data presentation encountered in their lessons

	Mean	S.D.	N.	Rank
Text	2.009	0.349	19	1
Photos	2.640	0.819	19	5
Maps	2.228	0.672	19	3
Diags	2.158	0.656	19	2
Graphs	2.412	0.839	19	4
Tables	2.930	0.768	19	6

APPENDIX M.

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 1.**

Teaching Strategies	Class 3.				Class 4.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.200	0.620	20	3	2.111	0.750	12	2
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.565	0.723	18	8	2.349	0.584	11	4
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	2.546	0.936	18	7	2.500	0.486	9	9
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	3.198	0.907	16	12	1.983	0.891	10	1
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.050	0.759	20	2	2.394	0.857	11	5
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.614	1.028	19	11	2.458	0.608	12	7
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.308	0.801	20	4	2.458	1.835	12	7
8. You are asked to explain some part of the topic in your own words or write an essay about it.	3.259	0.831	18	13	3.000	1.249	11	10
9. Pupils in the class discuss what has been studied with the teacher.	2.314	0.982	17	5			8	
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.579	0.806	19	9			8	
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			8		2.426	0.465	9	6
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.325	0.758	20	6	2.153	0.617	12	3
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.	2.000	0.897	18	1			3	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.604	0.972	16	10			5	

APPENDIX M.

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 2**

Teaching Strategies	Class 1.				Class 2.				Class 4			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank.	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.411	0.557	30	4	2.522	0.550	30	8	2.571	0.831	21	3
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.961	0.908	30	12	2.981	0.818	26	12	3.142	0.728	20	10
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	2.828	0.663	30	9	2.754	0.647	21	10	3.158	0.925	20	12
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	2.794	0.819	30	7	2.925	0.854	29	11	3.2	0.876	20	13
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.567	0.723	30	5	2.414	0.831	29	7	2.492	1.093	20	2
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.957	0.658	23	11	3.093	0.929	25	13	3.342	0.838	19	14
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.228	0.494	30	2	2.306	0.751	30	4	2.984	1.291	21	9
8. You are asked to explain some part of the topic in your own words or write an essay about it.	3.244	1.073	30	14	2.706	1.047	30	9	2.976	1.045	21	8
9. Pupils in the class discuss what has been studied with the teacher.	2.822	1.112	30	8	2.191	0.735	28	2	2.754	0.903	19	4
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.856	1.03	30	10	2.147	0.626	17	1	2.902	1.203	17	6
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.	2.294	0.992	30	3			1		2.958	1.149	16	7
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.206	0.622	30	1	2.284	0.660	27	3	2.302	0.838	21	1
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.	2.619	1.087	24	6	2.408	1.002	29	6	2.863	1.117	17	5
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.968	0.660	26	13	2.357	0.918	21	5	3.147	1.005	17	11

APPENDIX M.

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES TEACHER NO. 3

Teaching Strategies	Class 2.				Class 4.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.806	0.730	30	6	2.646	0.664	24	4
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.			1				0	
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	3.283	0.927	30	10	2.889	0.769	24	7
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	3.106	0.981	30	7	2.785	0.698	24	5
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.667	1.022	30	5	2.451	0.687	24	1
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	3.356	0.733	30	11	3.083	0.783	24	9
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.494	0.921	30	3	2.604	0.615	24	3
8. You are asked to explain some part of the topic in your own words or write an essay about it.	3.178	0.904	30	8	2.847	0.858	24	6
9. Pupils in the class discuss what has been studied with the teacher.	2.478	1.115	30	2			2	
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.661	0.993	30	4	2.507	0.928	24	2
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			0				0	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.			0				0	
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.	2.028	0.782	30	1			0	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	3.247	1.008	29	9	2.924	1.107	24	10

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES TEACHER NO. 4

Teaching Strategies	Class 4. Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.506	0.595	29	4
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.732	0.691	28	8
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	2.865	0.871	26	11
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	2.408	0.810	29	3
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.805	0.728	29	9
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.573	0.687	23	5
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.232	0.768	28	1
8. You are asked to explain some part of the topic in your own words or write an essay about it.	2.891	0.744	29	12
9. Pupils in the class discuss what has been studied with the teacher.	2.647	0.671	25	6
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.862	0.679	23	10
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			7	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.293	0.636	29	2
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			5	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.674	0.674	22	7

APPENDIX M.

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 5**

Teaching Strategies	Class 3. Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.887	0.754	25	4
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	3.140	0.874	25	8
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	3.360	0.673	25	10
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	3.367	1.117	25	11
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.979	0.853	24	5
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.799	0.992	24	2
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.840	0.762	24	3
8. You are asked to explain some part of the topic in your own words or write an essay about it.	3.327	0.956	25	9
9. Pupils in the class discuss what has been studied with the teacher.	2.727	0.878	25	1
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	3.073	0.700	23	6
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			8	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	3.136	0.863	22	7
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			9	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.			9	

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 6**

Teaching Strategies	Class 2.				Class 3.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.300	0.647	25	2	2.093	0.574	27	3
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.660	0.837	25	9	2.674	0.806	23	6
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	2.903	0.841	24	11	2.799	0.776	24	11
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	2.487	0.714	25	7	2.358	0.758	27	6
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.267	0.736	25	1	2.037	0.689	27	2
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.580	0.581	23	8	2.688	0.791	24	10
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.393	0.854	25	3	2.272	0.938	27	4
8. You are asked to explain some part of the topic in your own words or write an essay about it.	2.473	0.757	25	4	2.628	0.807	26	8
9. Pupils in the class discuss what has been studied with the teacher.	2.667	0.796	25	10	2.295	0.723	26	5
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.475	0.647	20	5	2.407	0.665	18	7
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			7				5	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.486	0.968	21	6	1.93	0.643	26	1
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			1				3	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.			9				10	

APPENDIX M.

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 7**

Teaching Strategies	Class 3.				Class 4.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.063	0.801	32	3	2.290	0.5	31	6
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.344	0.839	32	6	2.600	0.749	25	8
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.			4		2.811	0.647	22	11
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.			17		3.081	0.571	31	12
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.006	0.818	30	2	2.267	0.723	30	5
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.573	0.862	32	9	2.768	0.675	28	10
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.146	0.840	32	5	2.307	0.607	31	7
8. You are asked to explain some part of the topic in your own words or write an essay about it.	2.368	0.837	29	7	2.634	0.854	31	9
9. Pupils in the class discuss what has been studied with the teacher.	1.828	0.875	30	1	2.047	0.726	25	2
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.			13		1.977	0.765	29	1
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			0				9	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.115	0.949	32	4	2.178	0.701	29	3
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			0				20	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.557	1.022	32	8	2.232	0.624	28	4

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 8**

Teaching Strategies	Class 1.				Class 3.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.628	0.659	26	5	2.586	0.862	29	9
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	2.889	0.833	27	12	3.161	0.721	28	13
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	2.728	0.853	27	9	2.914	0.701	29	12
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	2.769	0.814	26	10	3.285	0.814	24	14
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.494	0.839	26	3	2.292	0.866	28	6
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.642	0.8	27	6	2.805	0.759	29	11
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.395	0.827	27	1	2.747	0.79	29	10
8. You are asked to explain some part of the topic in your own words or write an essay about it.	2.648	0.981	27	7	2.069	0.775	29	2
9. Pupils in the class discuss what has been studied with the teacher.	2.457	0.756	23	2	2.264	1.126	29	5
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.812	0.909	23	11	1.988	0.617	28	1
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			12		2.21	0.934	27	4
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.667	0.851	26	8	2.184	0.683	29	3
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			15		2.352	1.189	27	8
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.569	0.938	24	4	2.293	0.654	29	7

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 9**

Teaching Strategies	Class 3.				Class 4.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.871	0.653	22	5	2.679	0.474	14	4
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	3.158	0.597	19	7			0	
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.			2		3.191	0.606	14	8
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	2.765	0.805	22	4	2.714	0.914	14	5
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.758	0.658	22	3	2.310	0.669	14	1
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	3.008	0.689	22	6			0	
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2.409	0.759	22	2	2.631	0.624	14	3
8. You are asked to explain some part of the topic in your own words or write an essay about it.			1		3.012	0.662	14	7
9. Pupils in the class discuss what has been studied with the teacher.			1		2.75	0.765	14	6
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.			0				0	
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			0				0	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.381	0.460	21	1	2.548	0.436	14	2
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.			0				0	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.			0				0	

THE ATTITUDE OF PUPILS TO THE SELECTED TEACHING STRATEGIES **TEACHER NO. 10**

Teaching Strategies	Class 3.				Class 4.			
	Mean	S.D.	N.	Rank	Mean	S.D.	N.	Rank
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	2.493	0.603	24	3	2.246	0.870	19	4
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	3.147	0.811	25	12	2.600	0.695	15	7
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	3.035	0.777	24	10	2.965	0.847	19	10
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	3.254	0.944	23	13	2.677	0.815	17	8
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	2.500	0.927	25	4	2.219	1.009	19	3
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	2.947	0.790	25	9	2.798	1.049	19	9
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	3.127	0.977	25	11	2.597	0.956	19	6
8. You are asked to explain some part of the topic in your own words or write an essay about it.	2.913	0.983	25	8	2.565	0.877	18	5
9. Pupils in the class discuss what has been studied with the teacher.	2.507	0.878	23	5	2.146	0.952	16	2
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	2.899	0.848	23	7			9	
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.			15				4	
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	2.207	0.662	25	1	1.882	0.740	17	1
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.	2.227	0.911	25	2			4	
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	2.691	0.777	21	6			10	

APPENDIX N.

Teaching Strategies	THE TEACHERS' RANKINGS OF THE STRATEGIES									
	TEACHERS									
	1	2	3	4	5	6	7	8	9	10
1. Your teacher explains the topic of the lesson him/herself and tells you to look at maps, diagrams etc., in the book when he/she wants to talk about them.	9	7	1	2	1	2	1	-	1	2
2. Your teacher reads through the author's explanation of the topic with the class and you look at the maps, diagrams etc., with your teacher when the book tells you to.	5	11	X	3	11	6	X	-	8	10
3. You are told to read what the author of the book has written and to study the maps, diagrams etc., he has used on your own.	10	12	9	8	12	X	X	-	X	7
4. Your teacher dictates some notes on what you have studied or writes them on the board for you to copy.	6	9	3	4	13	11	X	-	5	12
5. Your teacher asks you questions orally about the meaning of the written information, maps etc., to see if you understand.	4	6	7	10	2	3	2	-	2	1
6. You are asked to answer some of the questions or to do some of the tasks set in the book in your exercise books or on paper.	3	X	5	7	14	9	X	-	10	11
7. You are asked to copy a map, diagram, part of the writing etc., from the book into your exercise book or on paper.	2	8	4	6	10	8	X	-	3	8
8. You are asked to explain some part of the topic in your own words or write an essay about it.	7	4	6	5	8	10	8	-	7	9
9. Pupils in the class discuss what has been studied with the teacher.	1	2	2	9	6	1	6	-	4	3
10. You are asked to give your opinion, either orally or in writing about some part of the topic or make suggestions about what should be done.	13	1	8	X	5	5	9	-	11	5
11. Pupils discuss the topic or a task in groups and report their views to the rest of the class or play the part of a committee trying to reach a decision.	X	5	X	X	4	X	7	-	9	4
12. Your teacher reads through the book with you, looking at the maps, graphs, descriptions etc., and tells you many things about parts of the topic not explained fully in the book.	8	10	X	1	9	4	5	-	6	6
13. You play a geographical game which shows you some of the problems other people face in their lives, or the effect luck has on them.	12	X	X	X	3	X	4	-	X	X
14. You are asked to describe your feelings, orally or in writing, about a topic or part of a topic being studied.	11	3	10	X	7	7	3	-	X	X